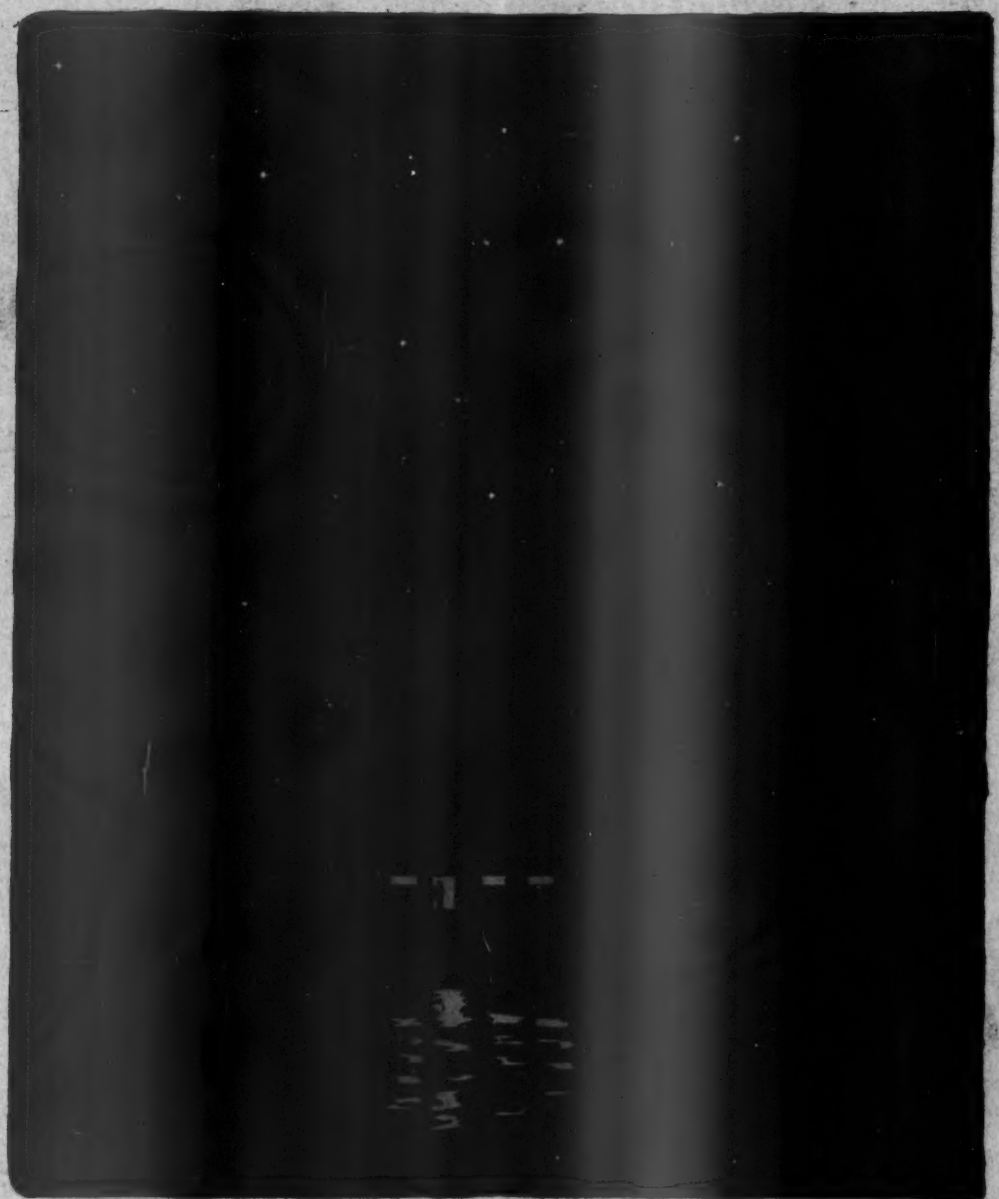
VOLUME 23 SEPTEMBER 1917 NUMBER 285

Forestry

American Forestry

UNIVERSITY OF MINNESOTA
Department of Agriculture



An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association

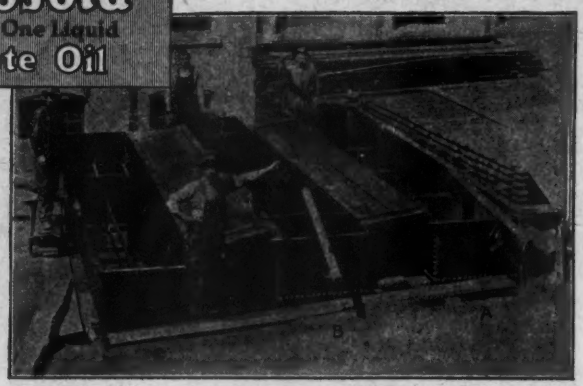
Washington, D.C.

Permanent plant erected by copper mining company; constructed of wood consisting of two tanks, one for "hot bath" and other for "cold bath." Used for creosoting timber and lumber used in surface-structures and mills.

Temporary treating-plant constructed of wood and lined with galvanized sheet iron. Used for creosoting over 250,000 feet B. M. of timber for floor-framing of industrial plant.

Barrett's B Carbosota Grade-One Liquid Creosote Oil

Permanent plant for creosoting of refrigerator-car sills and roof-boards.



Permanent portable plant built by large paper-mill for creosoting roof-boards and miscellaneous lumber. (A) Tank for hot treatment. (B) Tank for cold treatment. (C) Tank for catching drippings.

A Group of Open-Tank System Creosoting-Plants

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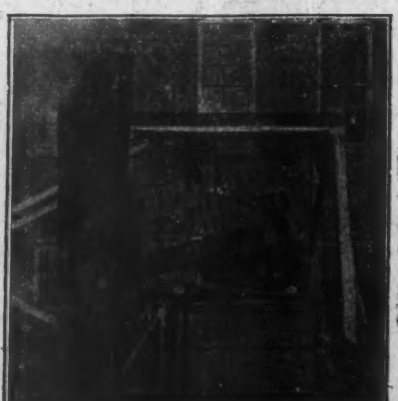
Permanent plant erected by large iron mining company consisting of two steel treating-tanks and one 10,000-gallon storage-tank. Used for creosoting miscellaneous timber and lumber.



Temporary plant constructed of wood lined with galvanized sheet iron, equipped with steam-pipes for heating creosote. Used for creosoting roof-timber and -boards for roof over machine-room of paper-mill

Modern Open-Tank Pole-Treating Plant. (Photo. courtesy Lindsley Bros. Co., Minneapolis.)

AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

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How mechanical bracing restores strength to decayed trees

THE internal woody tissue of the tree has the same function as the bones in the human body—structural support. When this has been destroyed by decay, Nature is helpless to restore it and the tree, if neglected, will soon succumb to the force of the winds. And no treatment can permanently save it unless that treatment supplies scientifically the strength that has been lost.

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Every tree is different, and therefore the bracing of each tree must differ from the bracing used in all other trees, at least to some extent.

The tree in photograph No. 1, for example, required a combination of bolts and lock-nuts, reinforcing rods, and cross-bolts with lock-nuts above the crotch.

The tree in photograph No. 2 needed a backbone and rib arrangement of iron straps, plus torsion rods and anchors.

The tree in photograph No. 3 required a combination of bolts and criss-cross bolts with lock-nuts, torsion rods and chains.

The tree in photograph No. 4 was so weak that it required a complicated and complete system of internal bracing, including cross-bolts, criss-cross bolts, iron straps, anchors, torsion rods, iron backbone and ribs, lock-nuts, bolts above the crotch, plus chains and lag-hooks higher up.

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NATIONAL FOREST TIMBER
FOR SALE

Location and Amount.—All the merchantable dead timber, standing or down, and all the live timber marked or designated for cutting on an area embracing about 3400 acres in Townships 1 and 2, R. 4 E., of the Basis Line, Smith Creek and Hopper Camp Branch watersheds, Cherokee-Georgia National Forest, Tennessee, estimated to be 4,800,000 feet B. M., more or less, of saw timber of poplar, white pine, shortleaf pine, white oak, red oak, black oak, scarlet oak, chestnut oak, hickory, basswood, ash, beech, and other species, 2,500 cords of chestnut acidwood, 600 chestnut oak ties, 460 cords of hemlock, poplar and basswood pulp, 12,000 locust posts, 340 chestnut poles, and 560 tons of hemlock and chestnut oak bark.

Stumpage Prices.—Lowest rates considered: Shortleaf pine, and chestnut oak saw timber, $2 per M; poplar saw timber, $8 per M; white pine saw timber, $7 per M; basswood and ash saw timber, $6 per M; red oak and white oak saw timber, $5 per M; black oak, scarlet oak, beech, hickory, birch, gum, and other species, $1 per M; hemlock, basswood, and poplar pulpwood, $1.25 per cord; hemlock and chestnut oak bark, $3 per ton of 2240 lbs.; chestnut acidwood, $1.50 per cord; chestnut oak hewn ties, 15 cents each; locust posts, 5 cents each; chestnut poles, 30 ft. long, 30 cents each; 35 ft. long, 50 cents each; 40 ft. long, 75 cents each; 45 ft. long $1 each; 50 ft. long, $1.25 each; 55 ft. long, $1.50 each; 60 ft. long, $1.75 each.

Deposit.—With bid $500 to apply on purchase price if bid is accepted, or refunded if rejected. Ten per cent may be retained as forfeit if the contract and bond are not executed within the required time.

Final Date for Bids.—Sealed bids will be received by the District Forester, Washington, D. C., up to and including September 10, 1917. The right to reject any and all bids is reserved. Before bids are submitted full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the District Forester, Washington, D. C., or the Forest Examiner in Charge, Blue Ridge, Ga.

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SALE OF TIMBER, WHITE MOUNTAIN APACHE INDIAN RESERVATION.

SEALED BIDS, MARKED OUTSIDE "BID, White Mountain Apache Indian Reservation Timber" and addressed to "The Commissioner of Indian Affairs, Washington, D. C.," will be received until 12:00 o'clock noon, Eastern Time, Wednesday, October 24, 1917, for the purchase of timber upon about 68,000 acres within Townships 8 and 8½ North, Ranges 23, 24, 25 and 26, and Township 9 North, Ranges 24 and 25 East, G. & S. R. P. M., Arizona. The sale embraces approximately 400,000,000 feet of timber (about 95% Western Yellow Pine and 3 to 5% Douglas Fir and other species). Each bid must state the amount per thousand feet, Scribner decimal C, log scale, that will be paid for timber of all species cut prior to October 1, 1924. Prices subsequent to that date are to be fixed by the Commissioner of Indian Affairs by three year periods, in accordance with operating and market conditions. No bid of less than Three Dollars per thousand feet for all species within the sale area for the first period will be considered. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent National Bank, in favor of the Superintendent of the Fort Apache Indian School, in the amount of Fifteen Thousand Dollars. The deposit will be returned if the bid is rejected, but ten per cent. of it will be retained if the bid is accepted and the required contract and bond are not executed and presented for approval within thirty days from such acceptance. If the bid is accepted and the contract and bond executed, the deposit will be applied as an advance payment on the purchase price. The right to reject any and all bids is reserved. For copies of bid and contract forms and for other information regarding the offering, application should be made to the Commissioner of Indian Affairs.

The Department of Agriculture has advertised a tract adjacent to the Indian Reservation containing approximately 235,000,000 feet of timber. The Indian timber and the National Forest Timber are being advertised at the same time with the understanding that the purchaser of these tracts may log them together. Information as to the National Forest Timber may be obtained from the District Forester, Albuquerque, New Mexico.

Washington, D. C., August 27, 1917. CATO SELLS, Commissioner of Indian Affairs.

235,000,000 FEET
NATIONAL FOREST TIMBER
FOR SALE

LOCATION AND AMOUNT.—All the merchantable dead timber standing or down, and all the live timber marked or otherwise designated for cutting on an area embracing about 55,200 acres in T. 10 N., Rs. 23 and 24 E.; T. 9 N., Rs. 23, 24, and 25 E.; T. 8 N., R. 23 E.; and the unsurveyed land in approximately T. 8 N., R. 24 E., G. & S. R. P. M., within the Sitgreaves National Forest, Arizona, estimated to be 235,000,000 feet B.M., more or less, of western yellow pine, Douglas fir, Mexican white pine, cork bark fir, and Engelmann and Colorado blue spruce. Approximately 95% western yellow pine.

STUMPAGE PRICES.—Lowest rate considered $2.25 per M feet for all species, rate to be readjusted October 1, 1924, and every three years thereafter until end of sale.

DEPOSIT.—With bid, $10,000, to apply on purchase price if bid is accepted, or refunded if rejected. Ten per cent. may be retained as forfeit if the contract and bond are not executed within the required time.

FINAL DATE FOR BIDS.—Sealed bids will be received by the District Forester, Albuquerque, New Mexico, up to and including October 24, 1917.

The right to reject any and all bids is reserved.

Before bids are submitted full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the District Forester, Albuquerque, New Mexico, or the Forest Supervisor, Snowflake, Arizona.

The Commissioner of Indian Affairs is advertising a body of timber on the White Mountain Indian Reservation estimated at 400,000 feet more or less adjoining the above advertised area on the Sitgreaves National Forest. The conditions of contract and conditions on the ground permit the logging of both areas as one operation aggregating over 600,000 feet. Full information concerning the character of timber on the Indian Reservation, conditions of sale, deposits, and the submission of bids can be obtained from the Commissioner of Indian Affairs, Department of the Interior, Washington, D. C.

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AMERICAN FORESTRY

VOL. XXIII SEPTEMBER 1917 NO. 285

THE FIRST FOREST REGIMENT GOES ACROSS

They've changed the Hun's ships names around;
Send us along, boys, send us along!
They didn't like Teutonic sound.
Send us along!
We're overdue beyond the seas,
To hold us here is just a tease,
So send us over, if you please,—
Send us along, along!

Chorus:

As "Leviathan" the "Vaterland"
Will gather no more moss;
From "Hamburg" to the "Powhatan"
Our gain is Prussia's loss,
But we don't give a rip
For the name of the ship,
So long as we get across!

We itch to get there on the ground;
So send us along boys, send us along!
Right in the scrap we would be found;
Send us along!
We do not look for any ease,
We'll work at first among the trees,
Then we'll fight in the final squeeze,
So send us along, along!

Chorus:

"Susquehanna" exchanged for "Rhein"
In river names is fair;
Our "Pocahontas" with "Irene"
As a Princess doth compare;
And the "Antigone"
Is as "Neckar" to me,
If she'll put us "over there!" —*New Song.*

THESE were the sentiments expressed by members of the Tenth Engineers (Forest) in the early days of September, when each one of those days that passed in the camp at American University grounds seemed very late, rather than early. They lengthened out instead of growing shorter as all September days should do, and all because the regiment had not yet departed from a seaport on the Atlantic coast for somewhere in France.

In the latter days of August the regiment had passed in review before the Secretary of War and Assistant Secretary Vrooman of the Department of Agriculture. While the Tenth Regiment is a regularly organized military unit, and a part of the war forces, it remains true that in great measure the work of getting the regiment together had been done by the Forest Service, one of the bureaus of the Agricultural Department, so Mars and Ceres, figuratively speaking, together watched the regiment swing past.

And it did swing past, with the stride of a veteran organization; yet it had been given only a few weeks of drill. The men had real quality to begin with. Bystanders remarked how tall and broad they were, how bronzed and fit they looked. Why should they not appear to be what they were—men used to working outdoors, at jobs that required strength and alertness. Among the lot, also, was a very considerable sprinkling of college men, including not a few recent graduates and undergraduates from the forestry colleges, from California on the West to Yale in the East. "Eddie" Frey of Cornell was one of the intercollegiate champions in the two-mile run when he helped his Alma Mater clean up all four places in the event against the picked men of all the leading universities of the country. Another Cornellian, and one of the smaller men, was George Kephart, coxwain of the Varsity eight-oar champions who had swept the Hudson at Poughkeepsie; and after that he was a member of Cornell's intercollegiate championship wrestling team. These men were typical of those who marched along with others who had achieved championships in "burling," cordwood-cutting, and the like.

After the final review, in which their fitness was everywhere apparent, they began to get impatient. They had men enough, and more than enough, for the unit which was to go across. Their equipment was complete, their personnel ready, chaplain and all.

The equipment included, besides sawmills and logging machinery and implements, a Red Cross ambulance and kitchen trailer, marked with the pine-tree badge of the Forest Service. These additional parts of the equipment were given by the members of the Forest Service, the funds being gathered in small contributions from office and field forces in Washington and on the National Forests, and in the various District headquarters in the West. Women clerks in the office and fire guards in the woods each gave her or his bit to these useful gifts, which were gladly accepted by the War Department and that department provided transportation for them along with the rest of the goods. Funds for an additional ambulance and trailer have been raised by District Six, which includes the administration of the National Forests in the States of Washington and Oregon. These will accompany additional forest engineer units now being recruited to follow the first one.

The welfare of the men is being looked after in other ways, and while no Y. M. C. A. unit accompanied it abroad, the work of such an organization is

being done by the regiment itself through men attached to headquarters. The Chaplain, assisted by Private Knowles Ryerson, who had specialized in rural social organization in California, will help to provide recreation, reading matter, and other comforts and conveniences. He took along a phonograph for each company, and was busily looking before he left for an angel to donate a motion picture projector. Six dozen talking machine records will help to introduce American ragtime to sylvan communities in France, and after they have been played out others will follow over. The Forest Service will help to supply the regiment with reading matter, and with various other necessary luxuries, under a systematic plan; and the American Forestry Association will see that they are supplied with tobacco and other comforts. If some of the fellows wear all the olive-drab knitted sweaters and mufflers that have been promised them they will be so swaddled up that they cannot move to do any work!

The last days at the camp were full of seeming confusion, but every activity was bent toward hastening the final get-away. Some of the last-minute hustle was due to the effort on the part of many of the newer arrivals in camp to make sure that they would be included in the first contingent, in case somebody, for any reason, might be unable to go at the last minute. No one wanted to remain as part of the nucleus of the following battalions. But everyone was cheerful and everyone was busy. Here was a group checking up the service records of the men who were going; there was another squad stencilling labels on boxes that were standing on every hand, while others with black paint and brushes were marking some of the boxes for use on the boat going over and some to go into the holds of the ship.

Major Dubois was omnipresent, gathering up the loose ends, and, as he expressed it, "busy like a bee." Major Chapman, with a most unpractised hand, was endeavoring to sew indelible name labels on his blankets and articles of apparel, while Major Benedict interrupted his own work of making a will to cast aspersions on Chapman's sewing, telling the latter to use white thread instead of black, to take shorter stitches and more of them, and finally to stop sewing said Chapman's name on his, Benedict's, blankets. There is no telling how much seriousness was cloaked under the raillery; possibly there was nothing but a boyish gladness at the prospect of their early departure. Captain Mason, at an Atlantic seaport—to use the phraseology of the "Official Bulletin"—was looking after the procurement and stowage of supplies; Eldredge was busy with equipment; Colonel Woodruff, in his office in the headquarters building, was the guiding center of all, to and from whom a succession of officers came and went on many errands. Every one was busy, clear down to the last private doing a farewell clothes-washing before he had to learn the methods of French laundering.

And now they have gone, sooner than most persons thought they would get away; sooner than seemed possible when the very barracks were begun only in late July; sooner, indeed, than they themselves had dared to hope.

A second regiment is already forming, with a good start in the later arrivals who came in for the first regiment, which was overmanned from an abundance of volunteers before the time came to go. The next regiment is to have ten battalions of lumbermen and woods workers, the first two battalions to be raised at once, with the help of the Forest Service; the other eight are to follow in a short time. In addition, nine labor battalions to be used in connection with the forest regiments are to be recruited, two of these to be made ready just as soon as possible.

Both the officers and the rank-and-file have been rapidly gathered for the following contingents, and the activities at the engineers' camp at American University have not been greatly slackened by the departure of the first twelve-hundred. It is hoped that the next unit will be ready in as short a time as that taken by the first regiment, and that they can quickly be put to work for the triumph of democracy in overseas service. More men are wanted, between the ages of 18 and 40, and preferably with skill in woods work. Lumberjacks, portable-mill operators, tie-cutters, logging teamsters, camp cooks, millwrights and charcoal burners are among the types of men desired.

Majors Graves and Greeley, already on the other side before the first contingent started, saw the great possibilities of usefulness for many more men than went at first. The British authorities first called attention to the need of the foresters: now General Pershing's army needs the aid of forest engineers quite as much as do the English and French.

The regiments which follow promise to be equal to the earlier one in everything except possibly in youthfulness and "pep." They already show a probability of being ahead of it in maturity of personnel and seriousness of purpose. A spirit of adventure undoubtedly allured many of those who went over with the Tenth; sober judgment and a deep realization of duty are calling the others. Even at that, it seems that many a forestry college will give of its undergraduates for the forces now gathering, provided they can get in by passing the required tests of physique and experience. Last year the professors were urging their students to stay in school and complete their courses; this year all are more strongly imbued with the idea that every one who can go over should do so, and in the capacity for which he is best fitted. Young men in the forestry schools ought to make good in the forestry regiments, and they will undoubtedly gain invaluable experience. The facts that some forestry students were among the first to go, and that the call for all able-bodied men to get into action is so clear and insistent, are incentives for an increased number of applicants from this type—a type which can be very useful, especially among the lower grades of non-commissioned officers. Preference is being given, however, to men who have had actual woods experience.

The first of the "goodlie companie" of foresters has gone. Others will follow soon. It is a good thing for the profession of forestry, and it is a good thing for the business of lumbering that both classes are working shoulder to shoulder in the forests of France. It was in these same forests of France, some four hundred odd years ago, that two classes—knights and yeomen—fought side by side and learned the beginnings of democracy, and the dependence of one upon the other. American foresters and lumbermen have been learning this interdependence to some extent already; there will be a hastening of the process in the solidarity which is bound to spring up from a common experience on the same ground in a far greater struggle.

WIDESPREAD ACTIVITY IN HOME FOOD THRIFT

By CHARLES LATHROP PACK

President of the American Forestry Association and President of the National Emergency Food Gardens Commission.

An inspection trip of community canneries was recently made by Charles Lathrop Pack, president of the National Emergency Food Garden Commission which is affiliated with the American Forestry Association. In these canneries, where neighboring families work together on a co-operative basis, Mr. Pack sees a splendid example of productive thrift. He makes plain in the following statement that the work of food gardening, of canning and of drying from Maine to California and from the Great Lakes to the Gulf has justified all expectations.

LET us consider what our home gardening signifies. It means that 1,100,000 acres of city and town land are under cultivation this year—much of it heretofore non-productive. The country-wide survey made by the National Emergency Food Garden Commission located nearly 3,000,000 food gardens, but this is not the best of the story. The canning and drying movement has brought back to thousands of American households an art almost forgotten since the days of our grandmothers. This is particularly true of the drying of vegetables and fruits which this year is being done by good housewives on a vast scale.

There is much evidence that our food gardens are helping our people to feed themselves more reasonably and will continue this helpfulness throughout the winter. The editor of the North American Review says in the September number: "Last spring, at garden planting time, we urged the increase of production partly through intensified culture to increase the yield per acre and partly through the increase of acreage by the cultivation of neglected fields and even small plots in suburban and urban areas. How well this policy was executed is seen in the reports of the National Emergency Food Garden Commission that the gardens of the country were this year more than trebled in area. Beyond question this achievement has much to do with the fact that the increase in price of garden products in the year was only 22 per cent, or less than one-fifth of that of bread stuff."

The results will this winter mean much for food F. O. B. the homes of America, and help us, by feeding ourselves, to feed our boys and our allies. We already have a million men under arms in our army and navy. There will be two million by spring. They must all be fed and the soldiers and people of France and England must be fed, and to a large extent fed by us—and we are going to see that this is done. In the canning and drying of vegetables and fruits the homes of America are contributing an important share.

The glass jar manufacturers of this country have delivered, to September first, about 119,000,000 quart glass jars. A survey of the household supply of jars in some twenty typical towns throughout the country shows that the housewives of America this year will use but one new jar to over three and one-quarter old glass jars on hand, and all of them, old and new, have been filled or will be filled. This makes possible the conservative statement that the home women of the country will conserve more than 460,000,000 quart glass jars of vegetables and fruits—certainly three times what has been accomplished before. The drying has also added several million dollars worth to the food supply by preserving vegetables and fruits.

All of us can contribute our share in fighting the battles of the great war by doing our part in food conservation. This war is as much our war as it is the war of Europe. Unless we can keep the soldiers of the allied armies properly fed and can prevent hunger among the women and children of France, Russia and England, the western line of defense may be thrown back toward the Atlantic seaboard, and it is well within possibilities that in that event we would see the army of the enemy on our own shores.

Much has been said about food thrift and food economy, but I want to come to the defense of the good women of this country because it is the women who really understand what thrift means. It is my experience that the patriotic women of America have been practicing thrift all along and that they know how to practice economy without parsimony. This year they have added to their duties the patriotic work of food production and food conservation. A thrifty woman is a blessing to mankind and the women know very much more about real thrift than the men.

We are going to win this war, and we are going to win it by fighting with food. You cannot starve Germany. Ambassador Gerard has told us so. But we will starve our allies if we are so short sighted and small and mean and unpatriotic as not to deserve the name of Americans. This must not be and I feel safe in saying that it will not be. We face a race of people under a government intent upon the mastery of the world. The war seems far away to most of us but we are in reality fighting for our national existence and our national fate. We will realize this more fully when the great stream of wounded and maimed of our soldiers are sent back to us from France. But none the less, we are going to win this war. Our soldiers are going to do their part. We are sending our sons to the front and we who are at home, men and women, can carry on the good fight and do our part quite as well as the man with the gun. I feel sure that the men and women of America are doing their duty. I feel sure of victory, and when that victory comes there may be erected a monument commemorating the greatest event in modern history, bearing these words: "FOR DEMOCRACY AND CIVILIZATION—A WAR WON BY FREE MEN AND FREE WOMEN FOR HUMANITY."

FOREST FIRES BURN MUCH TIMBER

ABSENCE of rain in some of the western states during the current season has created an unusual menace in the matter of forest fires. Until recently the danger has been kept down by the increased efficiency of the fire-fighting forces of the United States Forest Service and other agencies concerned with protecting the forests. Their work has been so effective that during the earlier part of the season the losses were slight and confined to small areas. Late in August, however, the outbreak of fires became so general as to cause serious alarm.

Reports received by the Forest Service indicated that the situation had then become more dangerous than at any time this year. Millions of feet of timber were threatened and it became necessary for the service to suspend some of its other activities in order to concentrate all available man-power and resources in fighting the flames. In Montana and northern Idaho two thousand men had to be engaged in the work under the direction of forest rangers. The expenditures in these two states during the earlier part of the season had aggregated about $170,000. With the increased danger the expenditure rose to $15,000 a day. The entire organization of the Forest Service in the affected districts has been devoting itself exclusively to fire fighting. Men from regions in which there are no fires have been relieving the rangers who have become worn out by their long exertions.

A grave phase of the fire menace is the threatened destruction of valuable timber intended for furnishing airplane stock for the fighting forces of the United States and its European allies. In Oregon and Washington this danger has been particularly emphasized. Several large mills supplying the government with material of this nature are in danger of having to make complete suspension of operations. The gravity of this situation is recognized by the Forest Service and every effort is being made to reduce the hazard to a minimum.

Prolonged dry weather has been responsible for the fire damage. The forests have become so dry that any fire which makes a start is likely to become a serious conflagration. High winds have prevailed also, and this has made control of even the smaller blazes extremely difficult. The seriousness of the situation is shown by the action of the governor of Oregon in postponing the opening of the hunting season in that state. This was made necessary by the need for keeping people out of the woods as far as might be possible.

Among the causes lightning has played an important part. Severe thunder storms have been prevalent throughout the mountain districts and these have resulted in many serious blazes. As a factor in causing forest fires lightning is one of the most difficult things with which the forest protectors have to contend. In a single limited area a short time ago 19 fires were started in one night as a result of lightning strokes. These fires usually start at the foot of trees which have been struck and they smoulder for some time before making headway. Frequently they cannot be detected until a wind fans them into a blaze and it is no uncommon occurrence for a number of such fires to betray themselves simultaneously to observers through the columns of smoke that arise some time after the storm. One of the most serious phases of fires started by lightning is that they are apt to be in places that are inaccessible to the fire fighters. Trees at great elevations are more exposed to the bolts than those lower down and this increases the hazard.

The efficiency of the fire-fighting forces in the west is declared to be better this year than ever before. This is largely due to the lessons taught by the experience of the last year. The loss in the National Forests until late in August was comparatively small as a direct result of this increased efficiency.

At the offices of the Forest Service in Washington it is said that some of the fires of the summer and fall are reported to have been due to incendiarism, but that carelessness has shared with lightning the chief responsibility. Fires started by campers, settlers and locomotives have been frequent. Little or no rain has fallen for weeks, and, while it may be possible to keep the fires in check by organized protective work, officials say that the danger will not be eliminated until the fall rains set in, and nature asserts her protecting influence.

WAR TIME USES FOR WOOD

THE manufacture of gunpowder requires large qantities of charcoal, which can be secured only from hardwoods, and even smokeless powder requires the use of wood alcohol in its manufacture. This product is particularly necessary in the making of gun cotton. Wood alcohol is also used as a solvent in medicine and the wood distillation industry will contribute largely to the extra amount of hospital supplies needed during the present war. Acetic acid or wood vinegar, which is another important product, is used in the manufacture of cordite and liddite, two high explosives. Necessary increases in the production of steel for war-time uses will require a large amount of charcoal for use in blast furnaces. Besides these direct uses, the development of the American dye industry takes over a great deal of the wood alcohol obtained from the distillation of hardwood.

TWO pieces of maple received from the National Hardwood Lumber Association, one of which was badly discolored, were tested at the Forest Products Laboratory at Madison, Wisconsin. In mechanical tests, where slowly applied loads were used, the two samples were about equal in strength, but in resistance to shock the discolored piece was decidedly inferior. A microscopic examination showed the cell walls of the inferior piece to be partially destroyed by fungi.

WAR AND THE FOOD PROBLEM

BY NORMAN C. McLOUD

If the individual members of the American Forestry Association could see the results achieved by the Association's Conservation Department in its efforts to help solve the national food problem they would realize that the work has not been in vain. In affiliation with the National Emergency Food Garden Commission this department has played an important part in the creation and conservation of a vast food supply. Through home gardening, home canning, home drying and home storage America has achieved a wealth of food products for both summer and winter. The growing season of 1917 has produced results hitherto unapproached in the annals of American gardening. In reckoning the worth of this garden crop general opinion accords generous credit to the efforts of the Commission and the Association's participation therein. The conservation of this yield is now under way, with results as important as those already achieved in the line of production. Every member of the Association is in position to help the cause by doing what he may to stimulate interest in canning, drying and storage for winter uses. Co-operation in this respect will be cordially appreciated by the officers and will constitute a patriotic service.

THE more closely one looks at the food situation these days the less certain he becomes as to the real center of interest. National attention is being given so many phases of the question that it is hard to tell which seems most important. Food production, food prices and food conservation are all occupying the center of the stage. The effect is that of a three-ring circus, and in the face of this circumstance the individual citizen has responsibility to all three. That he is fully conscious of this responsibility is shown by the success of the home garden movement, the popular enthusiasm on the subject of price regulation and the persistence with which the people of America are engaged in the home canning, home drying and home storage of vegetables and fruits for winter uses.

All America has been amazed at the success of the home garden movement. The new planting area created through the efforts of the National Emergency Food Garden Commission and the Conservation Department of the American Forestry Association embraces back yards and vacant land in and around every city, town and village in the United States. With more than three million of these gardens flourishing where none had grown before there has come an addition of three hundred and fifty million dollars in crop value. This tremendous contribution to the resources of the nation is of vast importance in its relation to food prices and food conservation. Its effect on prices is immediate. New competition to the extent of three hundred and fifty million dollars has been no mean factor in the cost of living during the summer of 1917. The thoughtful student of economics cannot fail to realize that without this competition the cost of living would have been greatly increased. Household expenses have been bad enough as it is. Without the food gardens they would have been far worse.

THE OLD BACK YARD.
A scene which was all too typical before home gardening was stimulated by the National Commission. Note the crop carefully and then look at the picture of the new back yard on another page.

Herein lies the importance of food conservation in its relation to the generous crop of the home gardens of the nation. It is not alone for the growing season that the increased planting area must be made to exert its beneficent influence. Nature's contribution has as much meaning for the winter months as for those of summer. Wise utilization of the heavy crop demands conservation for the future. Conservation for the future demands home canning, home drying and home storage. These things must be done on a national scale. This means that they must be done in every household, or, in larger terms, by every community of households working together as a unit. In no other way may America reap the full benefit of her heavy home garden crop. In no other way may the individual do such effective work in the regulation of food prices. In no other way may he accomplish such effective food conservation.

In its efforts to bring about the most effective thrift in handling the garden crops the National Emergency Food Garden Commission is conducting a nation wide campaign of education. This campaign is fashioned along lines to stimulate canning, drying, storing and other forms of preparing foodstuffs for

the winter season. The Commission's Home Canning Manual was its first contribution to the literature of practical conservation. This was a companion book to the Home Gardening Primer, which was circulated to the extent of a million or more copies during the spring planting season. In the canning manual explicit directions are given for preparing vegetables and fruits by the single period, cold pack method of canning in tins and glass. As an indication of the care taken in its compilation it may be mentioned that the original manuscript was prepared by the Commission's experts on a basis of their own experience and on information obtained from the United States Department of Agriculture and various other agencies. When the manuscript was in completed form copies of it were sent to a large number of the most competent authorities on the subject throughout the United States. In each case explicit criticism and constructive suggestion were requested, and in every instance the request was met with prompt compliance. In this way the manual was made to embody the best information from the best possible sources, and it was published in full confidence that it carried to the people of America the latest and most complete knowledge of the art of canning as developed by modern science.

READY FOR EITHER CANNING OR DRYING.
Who wouldn't envy the home gardener who produced this assortment of vegetables? The table is loaded with the products of a war-garden, worthy of the best professional growers. The products are here collected for canner or dryer and give rich promise for the winter.

SHOWING HOW SCHOOL CHILDREN GET AHEAD.
This picture suggests interesting possibilities in the way of pumpkin pies for the coming winter. The pumpkins were raised in war-gardens, planted and cultivated by school children and it is safe to guess that none of the young gardeners will go hungry for pie during the school season.

That this confidence was well warranted has been shown by the acceptance of the Home Canning Manual as a standard and authoritative addition to the national literature on domestic science. This acceptance has been widespread and cordial. In various branches and bureaus of the United States Government the manual has been given the stamp of official approval by its adoption for issuance to government institutions. Through the Marine Hospital Service and the Bureau of Education the booklet has been given wide circulation. As a result of suggestion in official bulletins government department employes have procured the manual for use in their own homes. In addition to general recognition from these official sources the manual has been the subject of a large demand from senators and congressmen for distribution to their constituents. Throughout the country the recognition has been in keeping with that accorded in official circles at the national capital. Its distribution has been undertaken and its use urged on the public by state and local departments of education, by state and local war committees and by countless clubs and organizations interested in food conservation and domestic preparedness. That this general acceptance was based on merit is not to be questioned. Without such merit the acceptance would not have been possible. With such widespread endorsement the Commission cannot fail to feel that its manual has taken a foremost place in the literature of economics and that its influence for constructive conservation is fully demonstrated. In the preparation of the Home Drying Manual similar care was exercised. Every precaution was taken to insure authenticity in the instructions for reviving the lost art of vegetable and fruit drying in the homes of America. No available authority was overlooked and the Commission felt that the booklet was a worthy companion to its manual on canning. In this instance also was the confidence given warrant by the reception accorded the work. The official recognition given the canning manual was invariably shared by its

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DRIED FOOD TAKES ITS PLACE IN SOCIETY.

Recognition of the value of dried vegetables, fruits and meats was given in a luncheon at the National Capital at which the hostess was Mrs. Robert Lansing, wife of the Secretary of State. This picture shows the guests, all of them prominent in the official set of Washington society. They agreed that the luncheon was one of the most delicious they had ever eaten. At the table, from left to right, are: Mrs. Redfield, wife of the Secretary of Commerce; Mrs. Hugh L. Scott, wife of the Chief of Staff of the United States Army; Mrs. Champ Clark, wife of the Speaker of the House of Representatives; Mrs. Lansing, the hostess; Mrs. Atlee Pomerene, wife of the Senator from Ohio and Mrs. Josephus Daniels, wife of the Secretary of the Navy.

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TOOTHSOME VIANDS AT MRS. LANSING'S DRIED FOOD LUNCHEON.

When Mrs. Robert Lansing, wife of the Secretary of State, entertained prominent Washington matrons at luncheon the entire bill of fare was made up of Dried Foods. This picture gives an idea of the appetizing spread. The six course meal included dried vegetable bouillon, dried chicken, dried vegetables of many kinds, dried fruit and dried mint. The Neapolitan salad was typical of the luncheon. It was made of dried peas, dried lima beans and dried tomatoes, with cream cheese filling. All the vegetables were "brought back" before using, by steaming and soaking. The roast chicken, shown in the center of the picture, had been first cooked, the dried in the oven and then steamed and soaked, to restore its original volume. With the chicken were served caramel sweet potatoes, corn balls and creamed dried cucumbers on toast.

SUCH A POTATO PATCH!

With war gardens of this nature thriving throughout the land America faces the winter with cheerful confidence. The boys did all the work and deserve all the credit.

sister booklet. Wherever the government or other agencies undertook the distribution of the one it did the same thing with the other. As a result of these various forces and of the distribution of 30,000 or 40,000 a day from the offices of the Commission each of the manuals has attained a circulation of several million copies. The aim of the Commission to place the booklets in practically every home in the land has approached realization and those who are familiar with the enterprise are of one voice in expressing appreciation of this patriotic gift to America at war.

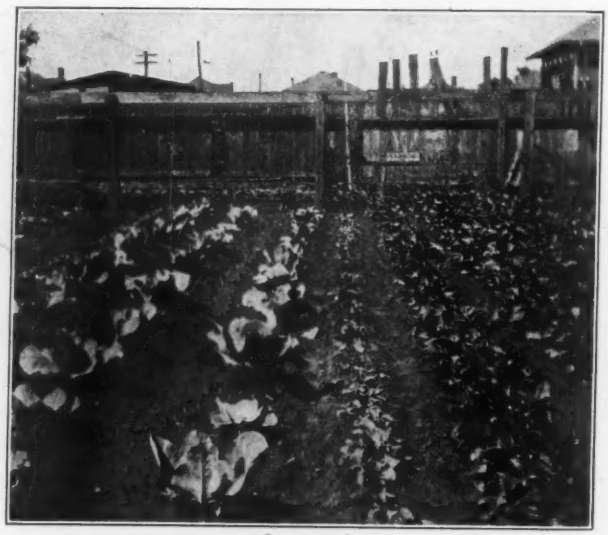
As an indication of the national importance attached to the preparation of foodstuffs for winter uses widespread interest was taken in a luncheon recently given in Washington by Mrs. Robert Lansing, wife of the secretary of state. At this luncheon the entire bill of fare was made up of dried food products. Women prominent in the social life of official circles at the national capital were included in the list of guests and all of them manifested genuine enthusiasm over the excellence of the luncheon.

Not content to rest on its laurels with a realization of work well done the Commission late in August made contribution of another booklet in its series of publications on food conservation. In the fourth manual explicit instructions are given on a variety of subjects involved in preparedness for the winter season. The topics include storage, pickling, fermentation and salting and to these are added directions for making potato starch, fruit butters and kindred products. Prepared with the same care given the other manuals the new booklet met with immediate welcome, and the demand for it has been such as to place a severe strain on already overtaxed printing facilities. With a determination to meet the demand promptly the Commission has had some of the largest printing establishments in Washington, Baltimore and Philadelphia running day and night. As a result there has been no delay in meeting requests for the various publications and this promptness has played its part in giving the manuals the widespread distribution with which they have met.

The storage of vegetables for future uses is as important as canning and drying. To keep vegetables in their natural state is regarded as the simplest form of preparation for winter needs and therefore one of the most useful. As a premise the manual declares that by taking proper precautions against decay and freezing an abundant supply of many kinds of fresh vegetables may be kept for winter uses at a minimum expenditure of money and effort. From the introduction to the manual I quote some of the arguments in favor of home storage as follows:

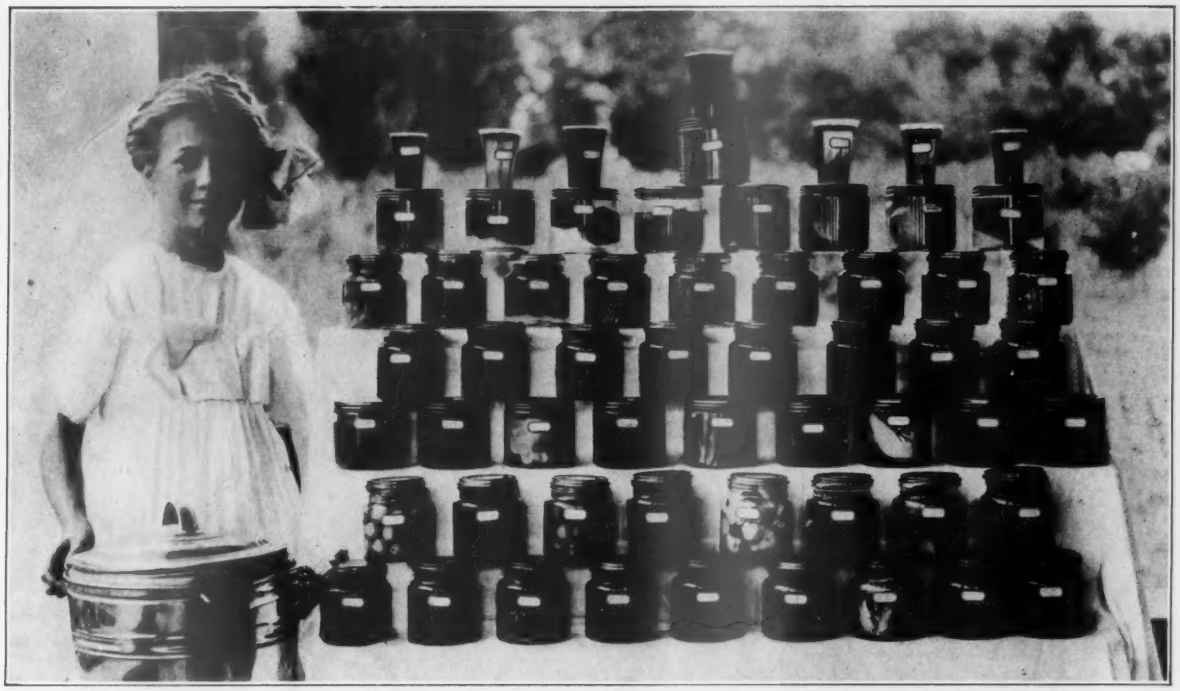
"The importance of making provision for winter food needs was never so great as this year. Every pound of foodstuffs than can be spared for export will be needed in Europe for feeding American troops and to prevent the starvation of the domestic and military population of the Allied Nations. Every pound of vegetables stored away for home uses will release food for export. A nation at war is a nation with a food problem. A nation with a food shortage is a nation in peril. For this reason it is of vital importance that no vegetables of high food value be allowed to go to waste.

"The home gardening campaign conducted by the National Emergency Food Garden Commission this year resulted in the creation of a vast new planting area. More than three million gardens have been planted where none grew before. The output of these gardens is greatly in excess of immediate needs. Unless proper steps are taken to safeguard the surplus the waste will be prodigious. This Commission has already stimulated nation-wide activity in canning and drying. The purpose of this booklet is to arouse similar interest in the storage of



THE NEW BACK YARD.

Instead of trash and tin cans the backyards and vacant lots of America now show crops of this nature. Note the contrast with the earlier picture of the old back yard—and take your choice.



DOESNT SHE LOOK LIKE A PRIZE WINNER?

This young woman has put up 56 varieties of vegetables and other food products. She is typical of those who are eligible to the winning of prizes in the Commission's national contest for the best canned goods displayed at a fair. She is an earnest believer in the cold-pack process, for she knows what it can do.

vegetables and in other forms of winter preparedness.

"Storage is an essential factor in Food Conservation. Households which fail to store their own supplies will find themselves forced to pay winter tribute to the wide-awake business concerns which have practiced storage on a commercial scale. By storing vegetables during the season of lowest prices even the household which has no home garden can save much of the cost that would be involved in winter purchases and incidentally make important contribution to the national food supply."

In its list of vegetables which may be placed in home storage to good advantage the Commission includes late potatoes, beets, carrots, parsnips, turnips, sweet potatoes, onions, celery, cabbage, salsify, dry beans, dry lima beans, cauliflower, brussels sprouts, squashes, parsley and even tomatoes. Various methods are explained for keeping these vegetables, ranging from the pantry shelf, the attic and the cellar to outdoor pits, cellars and cold-frames. One form or another of storage is available to every household. Even the apartment dweller can find the room and meet the requirements for storing some of the products mentioned. The results will well repay the slight effort involved.

Potato starch is given special attention in the manual. As an article of diet this home-made product has qualities that commend it to the consideration of every household. As a measure of conservation it utilizes culls, bruised, poorly developed and otherwise useless potatoes, of which it is estimated that probably 75,000,000 bushels go to waste in the United States each year. Another advantage is that it provides a healthful and appetizing food product which can be used in many ways where flour is now used. Added to these are the ease and simplicity with which it may be prepared. No equipment is needed other than a cylindrical grater or sausage grinder, a pan or galvanizing vessel for holding the potatoes, another vessel into which the grating

FAIR CANNERS AT A STATE FAIR.

An exhibit of canned goods prepared by a club of girls and displayed as an object lesson for their neighbors. This is food thrift in its most practical form and is the sort of thing that will enable Uncle Sam to feed the world.

A MAYOR AND A WAR GARDEN CHAIRMAN WHO ARE JUSTLY PROUD.

This picture shows Mayor Davis of Cleveland and George A. Schneider, chairman of the Mayor's War Garden Committee, inspecting the crops in a garden planted and cultivated by a troop of Boy Scouts. This garden is in the heart of the city and fronts on Euclid Avenue, a street as famous as the Champs Elysee or Piccadilly. This garden is one of the many which are to be found on the Lawns of Euclid Avenue. It is surounded by homes of wealth and fashion, and this environment doubtless had its influence in prompting the young gardeners to make their garden as attractive as possible. Mayor Davis is the man with his hands behind his back. Mr. Schneider stands next to him, towards the center of the picture. Scout-master McMasters is shown with his hat off, near the sign.

WAR GARDEN ON THE LAWN OF ONE OF CLEVELAND'S HANDSOME HOMES.

In Ohio the home garden found ready response. Cleveland is noted for its beautiful homes and broad sweeps of lawn. In this picture is shown the home of Mr. and Mrs. Edmund Stevenson Burke in the Wade Park district, one of the most exclusive residential portions of the city. Mr. Burke is a man of great wealth to whom home gardening appealed as a patriotic movement. Converting his well kept lawn into a garden patch he raised the crop here pictured, consisting of corn, cabbage, carrots, beets, tomatoes, beans, parsnips, pepper and parsley. Mr. and Mrs. Burke are spending no time waiting to see what the nighbors will send in for their evening meal.

WHAT ONE CLEVELAND FACTORY ACHIEVED IN ITS WAR GARDEN.

This is not a Kansas Ranch, as might be suspected from the broad acreage devoted to the raising of farm produce. It is the war garden of the Otis Steel Company's employes, on vacant land near the company's big manufacturing plant, in Cleveland. This is one of the gardens in which Mayor Davis and Chairman Schneider take much pride. It is typical of the factory gardens in one of America's greatest industrial centers. Such gardens have been made throughout the manufacturing district of Cleveland and other cities and their contribution to the nation's food supply is of tremendous volume. This garden includes thrifty crops of such vegetables as cabbage, corn, beans, potatoes, tomatoes, cauliflower, egg-plant, celery, beets, cucumbers and kohlrabi.

ANOTHER WAR GARDEN WHICH HAS THRIVED ON A CLEVELAND LAWN.

Louis F. Krieg is also a Cleveland home gardener who does not have to sit around waiting for contributions from the neighbors. From the looks of the garden here pictured the Krieg family has enough for the entire neighborhood. As a result of converting his vacant land into a new planting area Mr. Krieg has a crop which ranges through the alphabet from beets to turnips, and embraces cauliflower, onions, tomatoes, carrots, cabbage, Swiss chard, corn and cucumbers. According to a report received from George A. Schneider, chairman of the Mayor's War Garden Committee, this garden is one of the thousands which have made Cleveland one of the most important centers of city farming during the war emergecy.

or grinding is done and another into which to empty the gratings; water in abundance and cloths for wiping. The starch resembles wheat flour in whiteness and smoothness. Its use in making such dishes as boiled custard, lemon pudding, fruit blancmange, lady fingers, angel cake, lemon pie and sponge cake is described in detail in the manual. For these and some other purposes many expert cooks declare the starch to be superior to wheat flour.

CANNER INSTEAD OF CANNON.

The group here pictured forms an important part of the National Army. It is made up of members of a canning club in a Middle Western community. These food savers are playing a big part in the war-time emergency.

Fermentation and salting are also given detailed attention in the new manual. Complete instructions are given for the making of sauerkraut by both methods and directions are also included for the preservation of cucumbers, green tomatoes, beets, string beans and peas by fermentation. During the winter these vegetables may be served as they are or they may be freshened by soaking in clear water and cooked as fresh vegetables. Because of this feature they make an important addition to the winter diet and furnish useful variety for the daily bill of fare.

The manual also gives instructions for making peanut butter, apple butter, gingered pears, grape jam and various vegetable and fruit pastes for use as desserts or as garnishes. The variety of subjects included make an important addition to the household collection of books on food conservation. As with the booklets on canning and drying it is intended for free distribution. To procure a copy of any of these booklets an application enclosing two cents for postage should be sent to the Commission at 210-220 Maryland Building, Washington, D. C.

In addition to its publication and its daily canning, drying and storing lessons published in 2000 newspapers throughout the country, the Commission has made another contribution of national importance to the campaign for food conservation. This contribution takes the form of $5000 in prizes and National Certificates of Merit to be given home canners in every state of the Union and in various parts of each state. One thousand prizes of $5 each will be awarded for home canned vegetables displayed at fairs, food shows or other public exhibits held anywhere in the United States. With each

FROM GARDEN TO PANTRY SHELF.

Some of the steps in cold-pack canning are here illustrated. The vegetables make the journey from left to right, passing through the various processes from picking-over and washing to sterilizing in a wash boiler hot-water bath, placing in jars and sealing. The girls are all eagerness and enthusiasm as may be seen from their expressive faces. Suppose you try this on your own household.

HAVE SOME CARROTS?

Who could refuse such fresh and palatable looking vegetables as are here shown? These carrots were raised in a home garden and canned by the cold pack process.

prize will be awarded a certificate to serve as a permanent record for the holder. The only stipulations are that the canned goods entered in the contests shall be home canned and the product of a home garden in a city, town or village. Keen interest has been shown in the prizes and so general has been the response from fair officials as to indicate that the competition will be one of the most popular ever conducted on a national scale.

While popular interest is now concentrated on canning, drying and storage, the echoes of food gardening pour into the Washington offices of the commission in never ending stream. Typical photographs taken from the day's mail are those from Cleveland, Ohio, reproduced in this issue of *American Forestry*. In Cleveland the home gardening movement made a remarkable showing. Through the activities of a war garden committee appointed by Mayor Harry L. Davis, and with the cooperation of the National Emergency Food Garden Commission, the Ohio metropolis blossomed with food gardens from center to circumference. Chairman George A. Schneider was the active head of the mayor's committee and he carried on his work with an enthusiasm and effectiveness that have won recognition for him as one of the most successful of the year's leaders in enterprises of this nature.

In the work of individual gardeners an example of what may be accomplished in small space is given by the results of the home garden of Mr. and Mrs. R. L. Betty at West Point, Mississippi. On a piece of land less than 70 feet square the Betty family has produced and is still producing all the vegetables used on the table of a family of three for seven months, giving a supply that will continue until Christmas. In addition to this yield the garden provided the material for 640 cans of fruits and vegetables, prepared by Mrs. Betty on a small home canner. As an added measure of crop value may be mentioned the realization of $30.00 in cash from the sale of products not suitable for canning. Other results are one peck of dried corn, one peck of dried butter beans, one peck of California white peas, sufficient good seeds for next spring's planting, a good crop of potatoes and sweet potatoes, 10 pumpkins, 150 collards for winter and a 70 foot row of peanuts. The total expense for the garden was less than $5.00 and the expense for cans, canner and fuel less than $30.00.

This garden may be taken as typical of the results achieved by home gardeners throughout the land. Their contribution to the resources of the nation is tremendous. Their yield in individual comfort and satisfaction to their owners is of similar worth. Of no less value is the object lesson in thrift which these gardens have furnished. In the case of the Betty garden this thrift prevailed from seed time to harvest. Even the grass and weeds on the planting site were not wasted. All vegetable matter of this nature removed from the garden plot was saved to use in enriching the soil. This utilization extended throughout the season with the maturity of

COMMUNITY CANNING WORK.

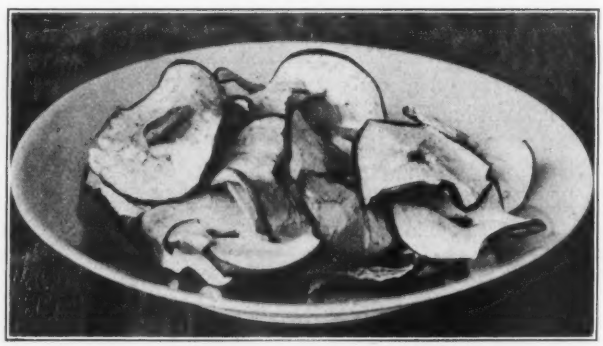
The Commission recommends cooperative canning and drying. If several families join forces and buy equipment the cost is slight to each household. By working together at some central place the work is easier for all.

the various crops. Tomato vines, for instance, were employed to enliven the soil for the asparagus bed. Corn stalks were placed in a ditch under the late potatoes to hold the moisture. Waste tomatoes from canning operations were thrown on a fertile spot, where the seeds germinated and produced plants which were sold to eager buyers for late planting. As a lesson in thrift such gardens as this furnish inspiration to all home gardeners. They are a manifestation of the true patriotism. Their owners are the true conservationists. Their carefully guarded food supply is the true secret of national preparedness. Without them America would face the chill of winter with dread and apprehension. Without them we would have difficulty in feeding even ourselves, to say nothing of supplying food for our troops in foreign fields and the people of our European allies. With the rich harvest of these gardens and the careful conservation of their output we can go into the coming winter with the calm assurance and quiet confidence which are essential to a nation at war. We can know that America is in position to do its duty toward civilization—a duty which involves food supply as much as it involves men and munitions.

WHAT COULD BE SIMPLER THAN THIS?

Here you see one of the easiest forms of vegetable and fruit drying. The three trays are made of strips of wood with galvanized wire mesh. They are placed on a table and facing the end of the trays is an electric fan. Excellent results are obtained in this way.

Among the nations engaged in the fight for freedom America is the one country with a surplus of foodstuffs. All Europe is in a state of chaos. Her fruitful farms are devastated and her producing peasants have become embattled warriors. Lacking the land for cultivation and the men for doing the work she must look to the United States for the means of sustaining life. Without our help she must face famine, and famine means defeat. Her soldiers cannot fight unless they are fed. Under the pinch of hunger her domestic population cannot give her armies adequate support. America's duty, therefore, is manifest. We must share our abundant stores with the people of Europe. That this may be possible we must practice food thrift without cessation. Nothing must be wasted. Nothing must be unwisely used. The surplus of summer must be made the abundance of winter. By canning, drying and storing for our own uses we will release foodstuffs for European export. Nothing less should be considered. If the world war is to result in victory for democratic arms and democratic institutions nothing less is possible. Every American citizen must become a soldier in the army of food conservation. Food waste is the foe and food extravagance the enemy plotter. Food economy must be the watchword and food thrift the battle cry. To keep these things in mind and act accordingly will mean victory. To ignore them will mean that the fight is hopeless. Faith in the people of America leads to the conclusion that the American food supply will be so wisely utilized as to bring about complete triumph for the allied forces of democracy.



DO YOUR APPLES LOOK LIKE THIS?

A dish of dried apples, neatly and efficiently curled by modern methods of drying. Think of the apple pies made possible by having a store of such apples on your pantry shelf.

PROFESSOR R. R. FENSKA who has been professor of engineering at Wyman's School of the Woods at Munising, Michigan, has resigned to accept a position as assistant professor of forestry at the University of Montana, Missoula, Montana.

A DEPARTMENT of Forest Chemistry has been established at The New York State College of Forestry with Dr. S. F. Acree, formerly of the United States Forest Service Laboratory at Madison, Wisconsin, in charge.

WHAT ABOUT TREE SURGERY?

BY J. HORACE McFARLAND

TREES are marvels of natural engineering. When I see a tall tulip or a great elm sustaining a gale of wind; when the small boy comes into view hitching himself out to the perilous end of a cherry branch; when a saucy robin scolds me from the very tip of a twig on which he has just alighted, I think again of the wonder of the woody structure that can carry so much of an overload, do and be so many things in flower, fruit and timber production, and yet be a most beautiful object in its adornment of the surrounding landscape.

I have several times tried out the breaking strain of little tree twigs, brought to the ground by progressive ice-storms. From twelve to sixteen times its own weight of ice encased the twig before it broke away, and then the break occurred by reason of wind pressure, not of overweight. Few engineers provide such a factor of safety as is found when a certain twelve-foot cedar at my garden gate bows its tips in a graceful semi-circle until the topmost twig touches the snow under the influence of the weight of slush with which it is laden.

READY FOR THE FILLING

Tree on the State Capitol grounds at Albany, N. Y., with decayed portions removed and ready to be filled by an expert tree surgeon working for the New York State Conservation Commission.

When I see a scene of this nature and realize that the tree is going to straighten up and become upright again after its winter trials are over, again the wonder assails me; wonder whether any human engineer would even think of designing a structure to stand such a strain! And, if he did venture, how would the engineer's tree look, in comparison with God's cedar.

Even disease is sustained by trees with resistance and fortitude not possible to man-made construction. When, after what must have been at least two generations of progressive decay, the great oak succumbs and is broken, it is seen that for many years the tree has existed, made leaves and acorns, and has done its beneficent work on a mere shell and remainder of its once sturdy trunk. The man-made column of Bessemer steel, once it has begun to rust, simply disappears in a few years.

Once a certain horse-chestnut at my home showed a "split" at the fork of its two main branches. When investigated, the split developed into a mass of rotten wood,

THE WORK PARTLY COMPLETED

The filling of the lower cavities of the tree with concrete has been completed and the method by which the operator is filling the upper cavities is indicated by the photograph.

Courtesy the Missouri Botanical Garden

TREE IN NEED OF REPAIR

in which was growing a young horse-chestnut tree with a bundle of roots fully two feet long and six inches through. In the crotch, opened by wind and snow, a mature root had lodged and finding germinating conditions, had begun literally to eat the heart of its own father-and-mother tree.

When fully explored, and the decayed wood removed, the cavity in this tree was found to embrace all of its main bole but a bare inch inside the bark and cambium, and to extend more than ten feet up the main branch. The tree was nothing but a shell, and the first gang of "tree surgeons" which had opened its wounds and diagnosed its injuries was aghast at the situation, being afraid to undertake final treatment. As the horse-chestnut occupied a strategic position on my lawn, and I was not of an age to calmly contemplate waiting twenty years or more for the gradual replacement of its effective beauty, I was willing to call in a consultant.

His conclusion was that the tree might be saved; and he prescribed an interior arrangement equivalent to the artificial leg my father tried to wear after his heroic experience at Gettysburg in 1863. Two lengths of flat iron, 2½ inches by ⅝ inch, each eleven feet long, were inserted and cross-braced. The clean cavity was made aseptic; a curious drainage lip was carefully cut around its edges, and then the whole of it was concrete-filled.

No, not the whole of it; for the concreting stopped short or inside of the bark surface at the drainage lip, or "water-shed," as I was informed it was called in the terminology of the trade. There must be no obstacle in the way of the rolling over of the cambium layer, if the operation was successful and the patient also lived.

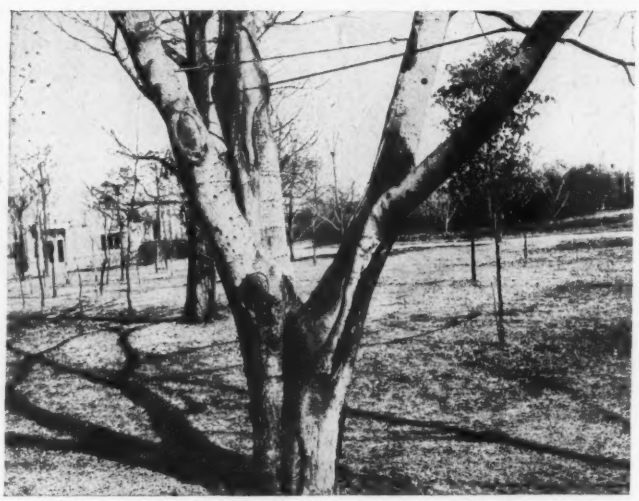
All this trouble had arisen because of the original split in the crotch of the tree. To avoid a recurrence of this split when the winds should again blow, the surgeon braced the big limbs above, not by rigid, unyielding iron, but by easy chain links, connecting the parts of the tree, but permitting wind movement. These chains were anchored by bolts run clear through the solid wood above the cavity, the heads being recessed into the central structure inside the cambium layer.

To provide an outlet for any moisture that might leak through, a drainage tube was inserted at the lowest level of the excavation.

There were five of these horse-chestnut trees, all of them important to my home, and all having been growing about it some thirty-five years before I came into possession. All were in trouble from crotch splits, though not to the extent described above. All were treated as seemed necessary, being cleaned out to sound wood, braced above and below, and duly filled with concrete. The work was expensive, as well as extensive; but when I contemplated the bill on the basis of putting the trees into prosperous health, as compared with their im-

Courtesy the Missouri Botanical Garden

BOLTED AND BRACED



Courtesy the Missouri Botanical Garden

FILLED WITH CONCRETE AND PAINTED

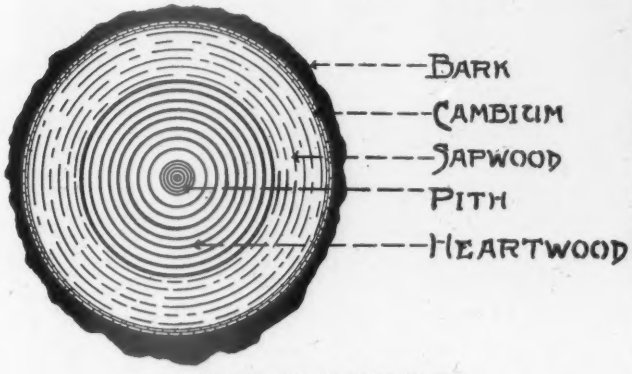
pending death by disease or mutilation by wind-storms, it did not seem so large. If I had had the amount of it piled up in copper cents, the bulk of them would not have gone far toward providing me with the shade and eye-satisfaction furnished by the living trees.

CUTTING OUT A CHESTNUT BLIGHT CANKER
A member of the Pennsylvania State Forestry Department being a tree surgeon, cut out this canker, filled the cavity and the tree was saved.

All this was eight years ago. What has happened? Has the tree-surgery been worth while? Did the patients live?

Indeed they have lived! And they have prospered amazingly, as shown by the way in which the cambium layer has "rolled" over the openings in the limbs and trunks. Some bolt-heads are covered in; several of the narrower cavities are almost closed; the trees have grown vigorously and bloomed exuberantly.

But there has been some later treatment by the tree-surgeons. Just as with man-surgeons, they are learning. When I think of the suffering endured by my father in the thirty years he lived after the surgeons had done their Civil War best—and worst!—with his two legs, and



CROSS SECTION OF TREE TRUNK

Copyright 1917 by International Film Service

TREE SURGEONS OPERATE ON PHILADELPHIA'S VETERAN ELM

The giant old elm, that has stood for nearly two centuries at the Dauphin Street entrance to Fairmount Park, Philadelphia, has undergone a wonderful and what promises to be a most successful operation at the hands of the Park Commission's tree experts, diseased portions of the trunk having been completely cut away and the huge cavity filled in with cement and the limbs braced with bolts and bars.

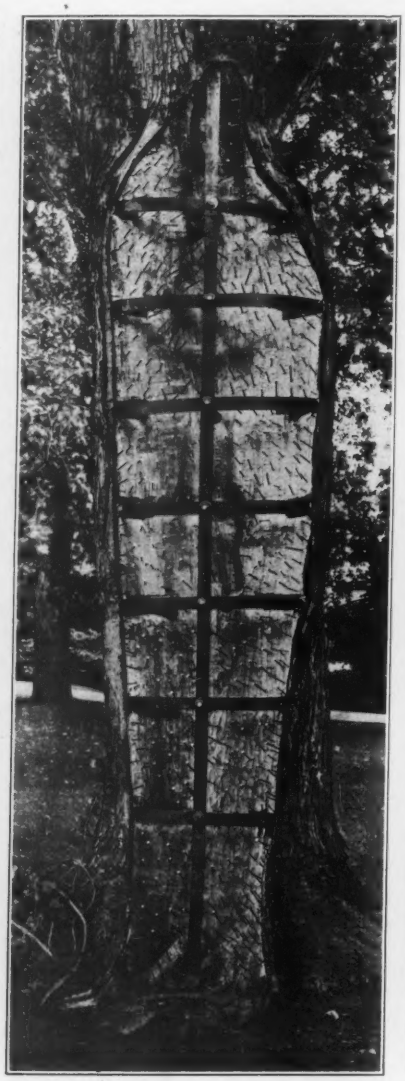
compare the conditions with the surgery of today, I have patience with and admiration for the advances in tree surgery within the past decade.

The solid concrete filling has proved to be too resistant to wind pressure, and it has been replaced by sectional filling, which yields enough to prevent strain on the remaining tree structure. The sides of the long cavities are now held together by ingeniously simple threaded bolts. The former coverings of zinc or tin have been discarded. More care is taken to make cavities aseptic. There are other refinements and some foolishnesses—at least some of the refinements look expensively foolish to me.

It is, after all, a question of good judgment, of tree values. That real tree-surgery is both successful and desirable, I am sure. That it is practiced by some who are ignorant and some who are venal—and by some who are neither, but are injudicious—is probably true. That its common-sense application, by men who have actual knowledge, will prolong the life of many fine old trees,

TYPICAL EXAMPLE OF "TREE PATCHING" ALONG IMPROPER LINES

If men were subject to such monstrous incompetence as that which has been applied to so many thousands of our fine old trees by untrained and irresponsible pretenders, men would suffer blood-poisoning, lock-jaw and death. But fortunately trees are sturdier than men and they come to their death more slowly, but none the less surely. This case of tree patching, like most of its kind, has violated all the principles of tree surgery and ignored the laws of tree life. The decay was only partly removed. The disease continued with increased intensity. No means had been provided to exclude the moisture. No mechanical bracing had been provided, in spite of the fact that decay had left the tree very weak.



MECHANICALLY BRACED TREE READY FOR THE FINAL WORK

Real tree surgery does three special things and insures a fourth. First, it removes all decay—all, not nearly all—and prevents further decay by proper disinfection, water-proofing and skillful preparation of the cavity. Second, it excludes all foreign substance, especially water, by the use of a novel and highly important device called the watershed, and also by a skillful method of filling. Third, it restores the physical strength of the tree by the use of wonderful types and combinations of mechanical bracing, most of which is completely encased in the filling on the inside of the tree. All three of these things are of vital importance and value.

OPERATION PROPERLY COMPLETED ON A VETERAN TREE

The fourth thing which real tree surgery insures is the restoration of the health of the tree and its preservation. An injury usually permits the entrance of a fungus disease. Once disease starts by attacking the interior cell structure, it proceeds with increasing severity. The tree responds gloriously to proper treatment and starts almost immediately to heal over the filling. In filling a cavity in a tree, it is highly important to insure it against cracking and breaking to pieces in the swaying and bending of the tree, which is often violent in the heavy winds. This is accomplished by correct mechanical bracing, plus the all-important sectional filling method, which is clearly illustrated in this photograph.

Photographs by courtesy of the Davey Tree Expert Company

cannot be doubted by any man of practical experience.

In a southern city I found sad evidence of work of the tree-charlatan. Certain splendid trees of *Magnolia grandiflora* had been "repaired" by the fakers permitted to represent a landscape-gardening firm carrying an honored name. These chumps had climbed the magnolia with pole-lineman's spurs, in order to brutally maltreat the head of the tree. The result was dreadful!

Other frauds, knowing nothing of tree life, and being essentially "butchers" rather than surgeons, saw off great limbs, calling it "trimming." One of this type filled with concrete a great cavity in an important family tree, making no provision for the rolling of the cambium. Water got in easily, rot was accelerated, and the tree had to be removed.

In another case, capable workers spent an unconscionably long time on two decrepit silver maples, at a frightful cost to the owner. Honest advice to him would have been that the trees were not worth the cost of repair, and that they would live awhile as they were, better trees being meanwhile encouraged to take their places.

The rapid expansion of tree surgery has led to the employment of men not at all acquainted with trees, or sympathetic with them. One such, probably knew the surgery part well enough, but did not know apart a pear and a persimmon! Tree-surgeons ought to be tree lovers and tree knowers, if I may force a word.

If tree-surgeons should know trees, then they could do more for trees than repair the mechanical injuries to which they are subject. The real tree-doctor ought to know about insects, and fungous diseases, and spraying and fertilization. He ought to be welcomed, whether he ever laid hand on a tree or not, from the assurance he could give to the tree owner as to actual conditions.

FOUR YEARS LATER

Note the result of scientific tree surgery. The bark has completely overgrown the concrete filling and the bolts and the tree's appearance indicates its healthy condition and sturdy development.

THE OPERATION COMPLETED

Note how this maple on the grounds of the Dan River Cotton Mills, Danville, Va., was treated in 1913. The concrete filling and the bolts can be plainly seen in the picture.

What about tree-surgery? It is, I believe, a proper and wholesome practice, if sensibly pursued and sensibly used. As I have hinted, there are frauds and fakers practicing it, just as frauds and fakers operate on men and women. They are in the minority, in both cases. The facts of tree repair are accessible to any one, as, for instance, in Dr. Bailey's great "Standard Cyclopedia of Horticulture." The practice of the work needs skill and experience. A tree-owner can decide for himself as to the essential importance to him of any certain tree; and he can get the opinion of an honest tree-doctor; or rather his diagnosis. Much good work has been done in tree repair, and more ought to be done. Many old trees exist in locations where they mean much to the nearby home or to the landscape. No newly planted tree can replace them, at least for decades of time. Such trees may often be given a new lease of life by thoughtful tree surgery. To me, there is a certain definite gratification in the realization that I have done my best for an old friend, that I have stopped the decay of his structure, and given his life processes free sway. A tree is a living organism to me, and I dislike the very thought of seeing such a marvel of God's creation in distress.

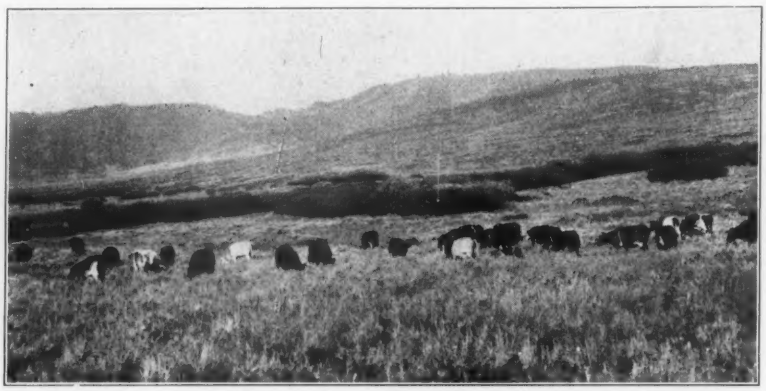
Tree-surgery is with us to stay, just as is the treatment of feeble-minded or crippled children. It is a work of mercy, and it evidences respect for age or dignity. It should be applied with good sense and good judgment. As I have said, tree-surgery ought to be joined to tree diagnosis and to tree doctoring, so that whatever was necessary for the prosperity of trees under consideration could be supplied, whether it be spraying, or protection against insects, or the repair of injured or decayed portions.

VALUE OF GRAZING MANAGEMENT ON THE CARIBOU NATIONAL FOREST

BY C. H. SHATTUCK

Professor of Forestry, University of Caiifornia

CARIBOU National Forest has developed the management of its grazing lands probably to a higher degree than any other forest in Idaho. It has been the writer's privilege to spend parts of two summers in an intensive study of the range and the methods employed by the officers in charge of this work, and to note carefully the present conditions as well as to make many comparisons of the present methods, and the results obtained by these management operations with former conditions and methods.



CATTLE GRAZING ON THE CARIBOU NATIONAL FOREST

Forage of this region has greatly improved during the past six years owing to proper handling of the stock and the range.

Ten years ago many parts of the range in Idaho were badly overgrazed. This resulted in the increase of the non-palatable plants, the decrease of the valuable forage plants, especially the better grasses, the destruction of the young trees, and often in severe erosion. All of these results were bad for the range and therefore for the men devoting themselves to the highly important industries of stock raising and wool growing. The general attitude of these men toward the future of these industries was extremely pessimistic. They were discouraged. They felt that there was far too much stock on the range for the good of either, and that the encroachments of the settler and new stockmen would soon ruin what had been a great and profitable industry. Many of the older men would talk of the good old days when the range was *good* and there was no strife and contention among them over the grass and water. But a large number of them had come to regard grazing as a badly overdone business which had seen its best days and was rapidly on the decline. The Department of Grazing of the United States Forest Service began some nine years ago to work out a system of grazing management with the general object of improving the conditions of the range and the range business. How was this to be accomplished? The problem was of vast magnitude, and was involved and complex. To begin with, the stockmen themselves had few suggestions as to how the range could be improved. In fact, most of them said it could never be done. A careful analysis of the situation revealed the fact that very little definite information was at hand with which to undertake the solution of such a tremendous but highly important problem.

Five general objects were deemed highly desirable and therefore most valuable to be secured.

Greater production in the amount of forage plants.

Improvement in the class of forage plants.

Closer utilization of much of the range lands both as to forage and water.

Improvements in the methods of handling stock.

A better system of protection of young forest

CATTLE AND HORSES TOGETHER.

These are to be found on the higher alpine meadows of the grazing range, Caribou National Forest.

growth against fire; and against excessive browsing; protection of range animals against poisonous plants and predatory animals; protection of the soil by avoiding excessive or very early grazing, and of the forage plants by proper rotation and deferred grazing.

RANGE CATTLE ON GRAZING LANDS

The types of range cattle showing dfferent breeds and condition of each as seen on the Caribou National Forest grazing lands.

In order to decide on the best methods to be employed for securing each of the foregoing improvements it was necessary to spend much time and money and employ considerable scientific and technical assistance. Also the experience and knowledge of the practical stockmen had to be drawn upon in no small degree.

In attempting to solve the problem of greater forage production certain studies were undertaken. One great fact was admitted by all, namely: that the range was gradually deteriorating both in the number of varieties of range plants and in the number of individual plants of the better varieties. First a careful grazing reconnaissance was made. This gave the topography, the types of plants, the per cent of ground-cover, the number of forage acres, etc. Then certain plots known as quadrats were carefully selected on which intensive studies of the plants were made. All the plants were named and carefully located on charts before the area was grazed; some of these were fenced and not grazed at all; others were grazed as the rest of the range; and others were grazed after the seed had fallen. These plots were carefully charted each year both as to the number of plants and the number of species. Also large numbers of range animals have been weighed repeatedly and careful records kept relative to their condition and that of the range. As a result certain fundamental facts have been very definitely determined, of which the following are the most important: that continuous and close grazing before the seeds fall causes a diminution not only in the number of individual plants, but also in the number of species of the more palatable and highly nutritious forage plants; that grazing in the early spring when the ground is soft is very injurious to the range, especially on hillsides and in marshy meadows where many plants and seeds are thrust down into the mud to perish, while others are stunted or destroyed because such ground dries out much worse later in the year than ground not so "cut up" by the feet of the grazing animals. It has thus been found that the amount of forage can be considerably increased by a close study of the actual conditions and the causes producing them.

It has been found that the class of forage plants gradually becomes poorer if the plants are not given an opportunity to mature and drop seeds at least every third year. Therefore it is now planned to defer grazing on each area as often as practicable until after the seeds have fallen. As a result of this practice the class of range plants has been steadily improving as anyone who has been at all familiar with former conditions may at once observe.

A closer utilization of the range both as to forage and water has in many places been brought about by studying the palatability of various plants for the different kinds of stock and for each kind of stock at various periods of the grazing season. For instance, the so-called green dock (*Weyethia amplexcaulis*) is greedily eaten by sheep if grazed about the time of flowering, but only sparingly later in the season; it and many other plants can be utilized much closer by being grazed at the proper time. Again, many parts of the range have been much more closely utilized by developing watering places in such a manner that the stock is not compelled to travel as great distances for water as formerly. A single spring dug out and piped into a series of watering troughs may be the means of utilizing from 2,000 to 5,000 acres of good range which has heretofore been useless for want of this water-development work. It is gratifying to see that many acres formerly of no worth have become highly productive by this means.

Much improvement has also been made in the methods of handling stock on the range, the close method of herding sheep has now been practically abandoned, and where considerable areas were formerly rendered useless for one or more years as a result of continuous bedding in one place, the range now remains uninjured by the new method practiced of shifting the bedding grounds after one or two nights spent at once place. Shifting the salting places is another method for saving the forage from excessive tramping and cropping, thus greatly protecting the more palatable and highly nutritious species. Also it has been found that closer utilization of the range can be secured by ranging both sheep and cattle on some

kinds of range at different periods of the grazing season. Sheep, for instance, following cattle, may find much good forage which the cattle have not injured, and vice versa.

Finally, the great subject of protection has been studied from every angle, and every phase of it has been improved. Formerly the range was annually burned off, the young tree growth largely destroyed, and each year large areas of standing timber were killed by these fires which were oftentimes set by the stockmen themselves to, as they thought, improve the range. This practice has been discouraged and prohibited as has the practice of excessive browsing which also did much injury to the young tree growth. As a result of these wise measures the forests on the Caribou are everywhere advancing and improving.

The range animals are now protected in a large measure against danger from poisonous plants, areas containing large numbers of such plants being marked and stockmen informed. Predatory animals and those injurious to the range are trapped, poisoned, and shot in large numbers. The soil is protected from erosion by wind and water because it is now much more evenly covered with plants than formerly, due to the improved methods of rotation, deferred grazing, and the avoidance of early or excessive use of any portion of the allotments.

On the whole, when one who knew the range ten years ago studies the same areas today and notes the great improvement in the forage, in the stock, and in the contentment and general satisfaction of those now engaged in the grazing business, he is amazed. Anyone who comes to see and understand all that has been planned and accomplished for the good of the range can have only words of praise for our wise Government in inaugurating a system which has produced such remarkable changes for the better over such vast areas. No one now wants to go back to the days of the over-crowded and unprotected range. The range business today is on a firm and thorough-going basis, and the stockmen and settlers should be thankful to the Forest Service for the methods so carefully planned and ably worked out by its officers and technical men. These methods are also a great aid to the farmers both directly and indirectly. The farmer who desires an allotment is directly benefited because he now gets better range and absolute protection; he may also be helped indirectly because the range business is now on such a stable plan of operation that he may count on a sure and excellent market for his grain and hay each year. This is because the stockmen are sure of their range both in the quality and quantity of their allotments and are therefore willing to pay good prices for the feed necessary to bring their stock through the winter and back to the range in the best possible condition. Thus the entire western region has been immensely benefited by the improved methods of grazing management as now practiced on the Caribou and many other National Forests.

OPEN METHOD OF SHEEP HERDING

This is the method now generally practiced on the Caribou National Forest. The scene here photographed is on the Morgan Meadows.

TAKE ADVANTAGE OF LARGE TREE SEED CROP

THIS year promises an unusually good crop of forest tree seed. Farmers owning woodlots should bear this in mind and make thinnings and cuttings wherever possible. Now is the time they say to get into the woodlot and inspect the trees before cutting. The trees can best be examined while they are in full leaf. All old, over-mature, decaying or otherwise unhealthy trees should be taken out at the earliest opportunity. Trees which are taking more than their share of light and space as well as those trees which are badly overtopped by their neighbors should go. Avoid making large openings in the woodlots, but plan on having any closed up within three to five years. A good crop of tree seed will do much to keep the land from going wild, but the woodlot owners must be careful not to cut too heavily.

POPULAR INSTRUCTION ON THE USES OF LUMBER

CORRESPONDENCE has been started by the National Lumber Manufacturers' Association with some 30 colleges and universities with regard to the giving of popular instruction upon the uses of lumber. The University of Wisconsin offered such a course two years ago, and similar courses were later offered by 10 or 12 of the leading schools. Since the war began there have been such great advances in the prices of all other materials, and such actual scarcity of some of them, that now is the best time we have ever seen to talk the right use of wood as a building material. The attention of the schools is being called to these facts, and it is expected that considerable interest will be aroused in instruction along these lines. It is proposed later to outline also a course of instruction upon structural timber for engineering students.

THE MOCKINGBIRD FAMILY

(Mimidae)

BY A. A. ALLEN

Assistant Professor of Ornithology, Cornell University

WHAT the nightingale is to Europe, the mockingbird is to our southern states. There is this difference, however, that the nightingale has but one beautiful song, while the mockingbird enriches his repertoire with the notes of many other birds. In fact, there is a record of one mockingbird which imitated 32 different species during the course of ten minutes' continuous singing. All individuals are not good mockers, however, and perhaps the majority confine themselves to their own brilliant notes. And brilliant their songs are, for the mockingbirds have marvelous technique and, while some people complain of their lack of feeling, others declare that they excel even the nightingale and the American thrushes in their emotional outbursts. They do not seek the deep forest and perhaps for this reason their music is less appreciated. "But," says Dr. Frank M. Chapman, "listen to him when the world is hushed, when the air is heavy with the rich fragrance of orange blossoms and the dewy leaves glisten in the moonlight, and if his song does not thrill you then, confess yourself deaf to Nature's voices."

Often it is the fence post in the garden, the ridgepole of the house or the top of the chimney that the bird selects for his songs and often he seems not to leave these spots for days at a time, pouring forth one continuous burst of music from dawn until dark and from dark again until dawn. At times he seems carried away by his song and springs into the air with quivering wings and trembling throat only to alight again with renewed enthusiasm. In fact, his wings seem at all times to feel the harmony and try to find some way of expressing it.

This is at the height of the courting season when no other mockingbird dare trespass upon his domain or venture to glance at the mate that he is defending, without inviting a combat. For his inspiration for singing is equalled by his ardor for fighting whenever another bird appears. Nor does he confine his pugnacity to others of the same species. Any enemy, real or supposed, cat, dog, hawk, owl, or man, has to suffer equally, receive his scolds, his buffeting and even the sharp pecks from his bill, if it venture too close to the nest. Mockingbirds are the wardens of the bird community and the presence of an enemy is announced from one bird to another more rapidly than the enemy can travel until the whole neighborhood is alarmed.

There is but one species of mockingbird found in the United States, but the bird of the West is sufficiently

Photograph by G. A. Bailey

READY FOR A FIGHT

With such weapons as it has, the brown thrasher is always ready to defend its nest against man or any other enemy.

A HOME AMONG THE GRAPE VINES

Where there are thickets or tangles of vines, the catbird is always found. Where these disappear, the catbird goes with them.

MUCH LIKE THE THRASHER

The wood thrush is often confused with the brown thrasher, but its breast is spotted rather than streaked, and its bill and tail are shorter.

distinct to be recognized as a sub-species. The species ranges throughout the country in suitable places as far north as the 38th parallel and occasionally further, occurring sparingly in New York and New England. Southward it ranges through Mexico and Central America to South America and most of the West Indies, being a permanent resident in all but the northern part of its range. From Mexico to South America there are other species, some ranging as far south as Patagonia, the total number being about twenty.

Our mockingbird is a slender, ashy-gray bird about the size of a robin, with white marks in the darker wings and tail. It is found about bushy pastures and the scrubby borders of woods, as well as about gardens, or indeed, wherever there is a thicket in which to hide and an exposed perch from which to sing. In some places along the Gulf it is the most abundant bird and its rich songs on every side drown out all the lesser bird voices of the vicinity.

The nest, which is a rather bulky structure of sticks and straws, rags and paper, is lined with rootlets and placed in a thick bush, an orange tree, a yucca, or even on the vines on the porch. The eggs are greenish-blue rather than heavily marked with dark brown.

In former years it was customary to keep mockingbirds in cages as pets because of their wonderful songs,

A BEWILDERED CATBIRD

A rag was placed across the eggs on the nest and the bird is here wondering what to do. It made no attempt to remove the rag but started to incubate beside it, illustrating the non-adaptability of the species.

and many birds seemed content to sing as beautifully from behind their bars as out in the open, even though their plumage usually became quite disheveled. These were birds taken from the nest when young and reared by hand, for adult birds, no matter how tame when free, would never submit to being caged. Instead they would beat their wings and peck the bars until they became covered with blood. Today it is a serious offense, punishable by heavy fines, to kill or to cage the mockingbird, for in most states there are laws forbidding the caging of native song birds. Likewise a Federal statute prohibits the shipping from one state to another or the importation of song birds native to this country, and more recently the Migratory Bird Treaty gives absolute protection in every state and in Canada to all insectivorous birds, the mockingbird among them.

THE UNSPOTTED, GREENISH BLUE EGGS OF THE CATBIRD

The other members of the family lay spotted eggs, but all build nests of sticks and rootlets.

Today, however, we care less for caging song birds for we have learned to attract them and hold them about our gardens by means of food and nesting places and protection from their enemies, so that cages are no longer necessary. Almost anywhere in the South, even in the heart of cities, if one has an extensive garden one can hope to have a pair of mockingbirds. He need only plant a suitable thicket for the nest, keep the cats away and put out plenty of food. In winter and early spring they are fond of suet, doughnut crumbs, pieces of bread and a few seeds, and later on of mulberries and other small fruits such as are borne on the dogwood, wild cherry, etc. Surely no garden in the South should be without its mockingbird.

There are over sixty species in the mockingbird family, only eleven of which are found north of Mexico. One of these is the true mockingbird, one is the catbird and the rest are called thrashers. The catbird resembles the mockingbird in being a long, slender, gray bird, but it differs in being darker and in not having the white bars in the wings and tail. Its only marks are a black cap, black tail and reddish-brown under-tail coverts. It gets the name "cat"bird from the harsh, catlike notes with which it scolds every intruder and with which it ruins an otherwise melodious song. Some catbirds are much better singers than others, many learning to imitate the notes of other birds with almost mockingbird skill, but all of them, sooner or later, interrupt their musical refrain with harsh mewing notes.

Catbirds are either very sympathetic to the troubles of all the bird world or very inquisitive, for whenever a bird is in distress and gives an alarm cry all of the catbirds of the neighborhood assemble to stare and to scold at the disturber. In the defense of their own nests they are seldom excelled for bravery, for be it cat, squirrel, snake or man, the intrepid birds bristle out their feathers and fly at the enemy with loud cries, pecking with their bills and buffeting with their wings in the attempt to divert attention from their treasures. Often they fall prey to sly cats which by stealthy leaps are able to reach them, but usually they slip out of reach into the thick vegetation, for the catbird always nests in the densest thicket, thorny bush or tangle of vines that the neighborhood supports. The nest resembles that of the mockingbird, but the eggs are deep greenish-blue without spots.

A WELL PROTECTED HOME

The nest of a mocking bird in a yucca. All members of the mocking bird family nest in dense bushes or thickets—where they are safe from most enemies.

A HUNGRY CATBIRD

When the catbird returns in the spring it can usually find plenty of insects to maintain its irrepressible energy. At times, however, a little suet is appreciated and it will come quite frequently to a feeding station.

In parks and gardens where thickets do not exist the catbird is not to be found, for unlike some birds such as the phoebe, robin, barn swallow and swift that have come to associate with man, the catbird is always unable to adapt itself to changed conditions. A few years ago the author pointed out the difference between the catbird and the phoebe in this respect.

The phoebe formerly nested only on the face of cliffs, but with the advent of man and his bridges and buildings, it has modified its nesting habits to avail itself of these conditions and now builds wherever there is a ledge to support and another to shelter the nest. The catbird, on the other hand, has never changed and probably never will. That the two birds have a fundamentally different

make-up was shown by the simple experiment of laying a rag across the nest of each bird, thus concealing the eggs. With one look the phoebe grasped the situation, flew to the nest and pulled the rag away. The catbird, on the other hand, was unable to comprehend, examined the rag from all sides and finally began to incubate beside it with no attempt at removing it. It showed itself, thereby, a non-adaptable species, and thus we find it throughout its range.

In some places in the south the catbird is regarded with suspicion and is believed to rob the nests of other birds, but in the north it is a favorite and no stigma is attached to its name. It is very largely insectivorous and therefore beneficial, although, together with the robin and the waxwing and many other birds, it shows a partiality for cherries and other small fruits in their season. Where mulberries and wild fruits are available, the cultivated varieties seldom suffer.

The thrashers, numbering about twenty species, are the largest of the mockingbird family. Their center of distribution is in Southwestern United States and they extend southward through Mexico and westward through Southern California and Lower California. Only one species, the brown thrasher or "brown thrush," as it is sometimes called, is found east of the Rocky Mountain region. It occurs throughout the East as far north as Quebec and occasionally somewhat further.

Thrashers or "thrushers," as the word is sometimes written, are dark brown birds, more or less thrushlike in appearance, but larger and more slender and have longer tails and somewhat curved bills. In fact, the word "thrusher" is thought by some to represent a "comparative" of the word "thrush," applicable because of the larger size of the thrashers. However this may be, the brown thrasher is often confused with the wood thrush, although it differs in its much longer bill and tail and its streaked rather than spotted underparts. It is a shy bird, much more often seen than heard, for it keeps to the undergrowth, where it scratches among the leaves or digs holes with its bill, in its search of larvae. The sound produced as it apparently blows the soil from its nostrils is an almost animal-like sneeze. When singing the male mounts to the topmost branches of a tree from which its loud ringing notes can be heard for long distances. The song is a rich medley and though limited in its range and confined to one air, rivals the mockingbird's in its exuberance and perfection.

Occasionally the thrashers live about gardens, especially if some effort is made to develop a tangle of shrubbery in which they can always find seclusion and safety from stray cats. Like the mockingbirds and catbirds, they will come to a food shelf for suet and crumbs and sometimes become quite friendly. They are equally ferocious in the defense of their nests, which are built in the heart of a thicket or on the ground beneath a tangle of vines, and they do not hesitate to peck and scratch one venturing too close. Their nests resemble those of the catbirds and mockingbirds, having an outer layer of sticks and a lining of rootlets, but the eggs are different from both, being rather slender, grayish in color, finely and evenly speckled with brown.

The curve-billed thrasher of Texas and New Mexico, the Palmer thrasher of the cactus deserts of Arizona, the California thrasher of the Pacific Coast region and the Crissal thrasher of the whole Southwest are all about the size of the brown thrasher, but are less strikingly marked, being uniform shades of brown or gray with few streaks. The sage thrasher is a somewhat smaller bird, appearing like a small mockingbird with a streaked breast. It is one of the commonest birds of the sage brush country and has much the same habits as the other members of the family.

LUMBER FOR THE EXPEDITIONARY FORCE

TWENTY-FIVE million feet of lumber and timber are wanted in France at an early date, it is reported, for the use of the American expeditionary forces. This will supply some of the needs of the troops for forest products until the American forest engineer regiments reach France and begin cutting.

It is reported that 10,000,000 feet of lumber and timber should be delivered in France by September 1, 8,000,000 feet by October 1 and 5,000,000 feet additional by November 1. All this is said to be in addition to the 4,000,000 feet of dock timber and lumber for which the engineer corps of the army opened bids July 21.

The material wanted for use in France is described by lumbermen as square and sound. It is needed for wharves and docks, railroads, bridgework and terminal construction. It is said that it may all be bought within a hundred miles of the seacoast in order to insure prompt delivery.

Samuel M. Felton, president of the Chicago & Alton Railroad, who is in charge of arrangements for the ten or twelve regiments of railroad engineers for service in France, is much interested in the plans for buying American timber and lumber for use in France.

FORESTERS IN DEMAND

BY reason of the enlistment of numerous foresters throughout the country for service abroad the war is making a heavy demand upon the forestry profession. Further, the war-time demand for forest products for a thousand uses from wood alcohol to bridge timbers means increased activity in the lumber business, which employs many men having forestry training. The national and state forests of the country must not be neglected in the face of so great need for their products, which points to the increased opportunities for men in this young but important profession.

"FORESTS do not improve by disuse any more than a man's muscles grow stronger in idleness." The farm woodlot is a small forest and will repay the owner who takes care of it.

QUEEN ANNE'S LACE; THE PAPAW TREE, AND SELF-HEAL

BY R. W. SHUFELDT, C.M.Z.S.

NEXT to a big field of ox-eye daisies in June or July, we have no wild flower display in the eastern half of our country that can in any way compare with an old pasture field, overgrown with Queen Anne's Lace, or one which in reality is more thoroughly picturesque (Fig. 1). Of course, our farmers have long ago ranked the plant among the most vicious of weeds and an arrant pest, and he finds no trouble or lack of facts to support the execrations he is ever ready to heap upon its name. In so far as his material interests are concerned, he is doubtless quite correct. To the lover of wild flowers, however, the plant has everything that is beautiful of its kind to offer—everything that appeals to the lover of life out-of-doors. Ages ago, it was a common plant of many parts of Europe as well as of Asia; and, as Neltje Blanchan truly remarks: "From Europe it has come to spread its delicate wheels over our summer landscape, until whole fields are whitened by them east of the Mississippi. Having proved fittest in the struggle for survival in the fiercer competition of plants in the over-cultivated Old World, it takes its course of empire westward year by year, finding most favorable conditions for colonizing in our vast, uncultivated area; and the less aggressive native occupants of our soil are only too readily crowded out. Would that the advocates of unrestricted immigration of foreign peasants studied the parallel example among floral invaders."

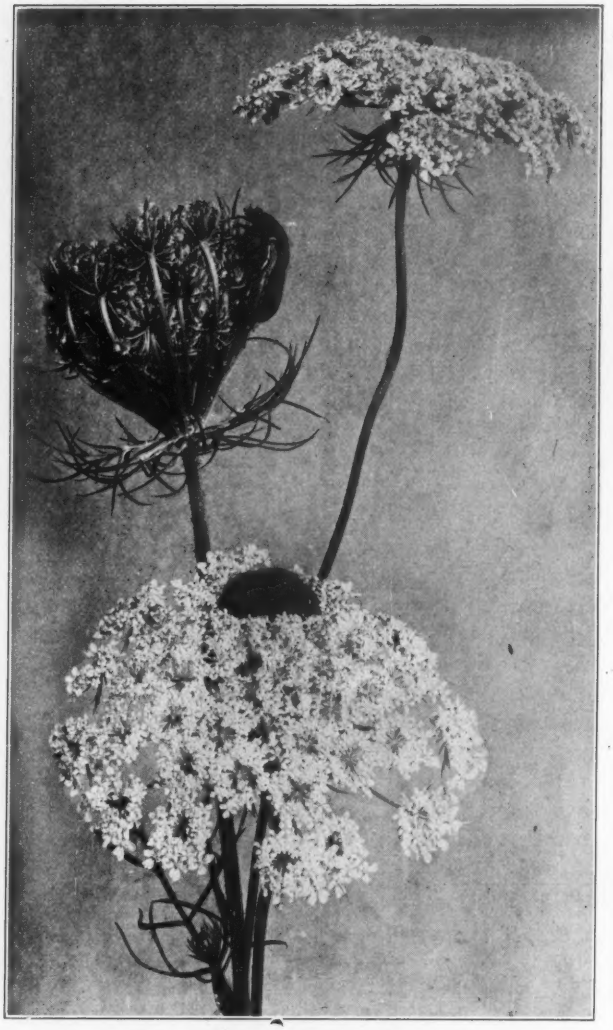
AN ARMY OF QUEEN ANNE'S LACE

FIG. 1.—View of a meadow in August monopolized by Queen Anne's Lace, a widely known plant of the Parsley family (*Daucus carota*).

The entire structure of the plant makes for this marvelous extension over vast areas; not only is it hardy by nature, exempt as food for cattle of any kind, but nearly a hundred different species of very industrious insects take part in its thorough fertilization. Indeed, blooming as it does all the way from June to September, it thrives during that part of the year when insect life is most abundant and varied. Thousands of the wasps that construct the paper nests are among the forms that may be seen in any field of Wild Carrots—as some people are pleased to call them—though wild carrots they surely are not, notwithstanding the fact that the big, fleshy root looks like a carrot. Armies of beetles, bees and many kinds of flies also do their part in fertilizing the flowers of this plant; in fact, it well repays one to visit a field overgrown with Queen Anne's Lace, and, magnifying glass in hand, study the remarkable structure of the tiny, individual flowers as well as the hosts of insect forms that visit them in August. Even the flower shown here in Figure 2 may be studied with profit by the aid of a good lens—which the reader can easily demonstrate by trying it.

So well known and distinctive is this plant that it quite obviates the necessity for giving a detailed botanical description of it here. One may readily turn to this in any reliable work on American wild flowers. It may be as well to note, however, that the flowers of this conspicuous biennial are arranged in umbels; that its stem is bristly, and that its leaves are pinnately decompounded. Many people call it "bird's nest" because late in the season the flower-stalks erect themselves to form a concave mass, not altogether unlike in form the nests built by some birds.

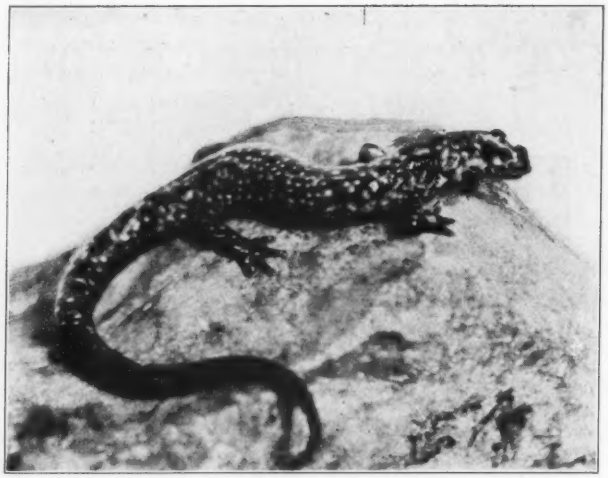
On one point authors differ with respect to these flowers. Neltje Blanchan says that they possess a "suffocating odor," while Alice Lounsberry remarks that they are "scentless." Truly it may be said that, through their rather strong odor, a field of them may be perceived at quite a distance, provided the wind favors its conveyance to the point where you are standing. It possesses a sort of wild, out-of-doors, waste-field pungency that is by no means altogether disagreeable.



QUEEN ANNE'S LACE IN FULL FLOWER

FIG. 2.—Note the one in the middle which has been generally fertilized, and is now closing up. These hollow "nests," late in summer, are familiar to all who know the plant. Note the central dark purple flower in each umbel of the other two, a feature that may be absent in some. The beautiful green beetles on the plant are well known to collectors.

Not a few of our native trees possess very beautiful blossoms; and, as they stand among our wild flowers, they legitimately come in here for occasional description. The blossoms of our Papaw tree are among the most interesting of these, and fine specimens of them are here shown in Figure 4, while the semi-ripe fruit is shown in Figure 5. Charles S. Newhall, in his work on "The Shrubs of Northeastern America," states that the flowers of the Papaw are "dull purple, in drooping clusters, appearing with the leaves." That they are in drooping clusters is far from correct, as may be seen in the accompanying illustration. The blossoms are of a very deep liver red, bordering on dark purple; as a matter of fact, they come out at the time when the thin, obovate-lanceolate, pointed leaves appear. Our North American Papaw (*Asimina triloba*) is the sole representative of the Custard Apple family (*Anonacem*) in this country, while it has many trees and shrubs related to it in the tropics; these belong in the same family. Note that the flowers



THE SLIMY SALAMANDER

FIG. 3.—While collecting flowers in the damp woods in August, one may meet with the Slimy Salamander (*Plethodon glutinosus*). This beautiful little batrachian ranges from Canada to Florida, and westward to Texas. It is generally black in color, finely speckled with pale gray. The reproduction here given is from a photograph from life, and gives the specimen natural size.

FLOWERS AND YOUNG LEAVES OF THE NORTH AMERICAN PAPAW

FIG. 4.—The fruit is edible in the autumn, and in its half-ripe stage is shown in Figure 5.

have six rather thick petals, arranged in two rows, the outer set being the larger. A globular mass in the center is made up of numerous stamens. The pistils are few in number, and when they mature and ripen they come to be a large, pulpy fruit, having the form of the one we see in Figure 5. These range from six to fourteen centimeters in length; and while a palish green at first, and slightly speckled, they gradually turn a deep brown or almost black. At this stage they are ripe and possess a soft, sweet, custard-like pulp, which many people appear to relish in the early fall. Papaws are found growing only along the banks of streams and rivers, often surrounded by the aquatic plants and shrubs found in such places. Some of the trees may attain a height of from twelve to fourteen feet, while others are stunted and shrub-like. One of its peculiarities is to give off rather a disagreeable odor when the smooth, pale grey bark is bruised in any manner. The flat seeds of the fruit are not numerous and are arranged horizontally.

Papaws are found growing in many localities throughout the eastern parts of the United States, and of recent years they have received no little attention on account of the demand for the ripe fruit in the autumn. The

FRUIT OF THE PAPAW

FIG. 5.—Papaw trees grow luxuriantly along the Potomac River, on the Maryland and District sides, above Washington. The insect shown resting on the fruit is a common cicada, popularly known as the "locust," which is erroneous, as the American locust is a very large grasshopper.

A MUCH DESPISED WEED

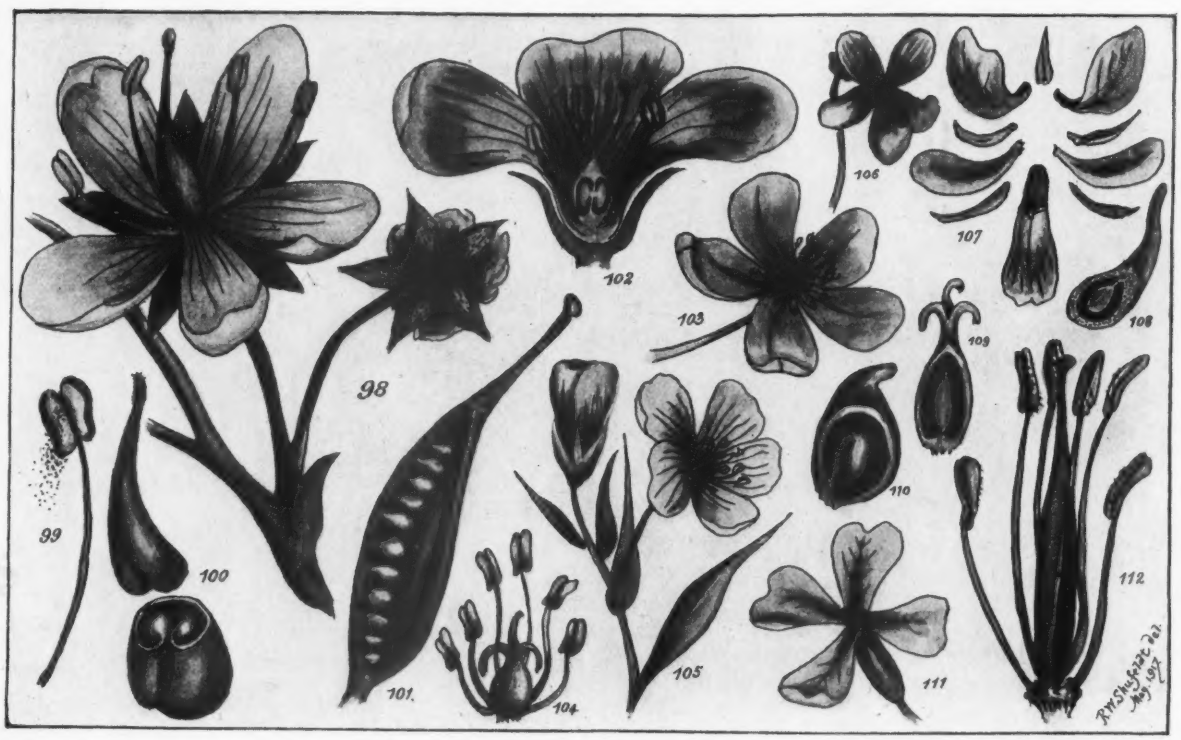
FIG. 6.—The plant and its flowers here shown is a specimen of *Prunella vulgaris*, popularly known as Self-heal, Heal-all, or Carpenter-weed, with some dozen or more other names in the vernacular. It is a plant with a history, and occurs over large areas of country in North America, Europe, and Asia. The example here shown was collected in the District of Columbia, and Gray states that a variety of it, *P. laciniata*, is "said to be introduced near Washington, D. C.," where, it may now be added, it is very abundant.

leaves become very large and long by August, while the flowers may appear as early as the last days of March. It receives its generic name from Asiminier of the French colonists, and this from the Indian name *assimin;* its specific name, *triloba,* from the flower structure described above.

We have a large family of wild flowers in this country known as the *Labiatae* or Mint Family, so called on account of the labiate form of the corolla. Small glands are scattered over the leaves containing a volatile oil of a warm, aromatic pungency, for which mints and their allies are well known. Many familiar plants are contained in the group, such as Bugle-weed, Germander, Pennyroyal, Blue Curls, Skull-cap, Cat Mint, Horehound,

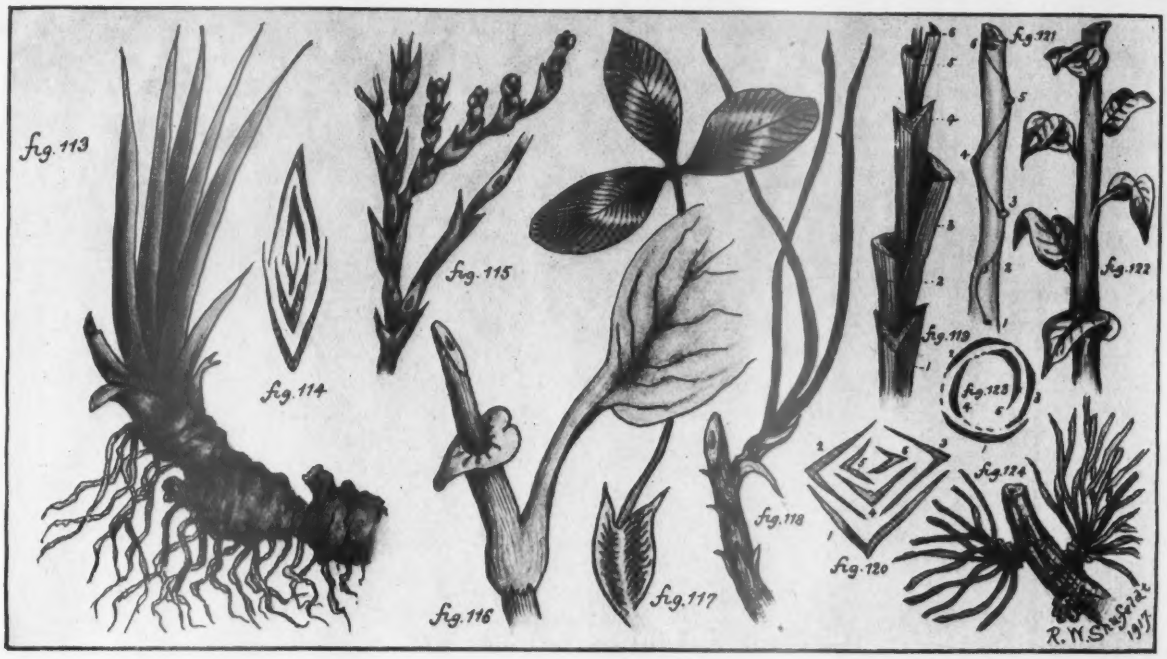
Giant Hyssop and the Horse Mint and Sages, Nettles, and so on. Among this very interesting assemblage we find a modest little plant widely known as Self-Heal (*Prunella vulgaris*). This flower is not only found in the woods and open fields, but it grows abundantly along the roadsides in the country districts. Here it is often thickly powdered with dust, and appears to be but a shabby, good-for-nothing weed; but a summer shower soon washes off the dust of the roadway, and a most beautiful little plant is at hand for study and admiration. Upon referring to Figure 6 we can appreciate what Gray says of *Prunella*: "Low perennials, with nearly simple stems, and three-flowered clusters of flowers sessile in the axils of round and bract-like membranaceous floral leaves, imbricated in a close spike or head." As will be noticed, the leaves are ovate oblong in outline, and their margins may be either entire or toothed, petioled, pubescent or somewhat smooth. The two-lipped flowers are very rarely white, but most often violent or creamish flesh color, being almost twice the length of the calyx, which latter is of a purplish color. The flowers are well shown in the accompanying cut, and by its aid the plant can be easily identified when taken in connection with the above description.

Prunella was formerly written *Brunella*, from the old German word braüne, which means quinsy, and all the old herbalists believed that Self-Heal would unfailingly cure that disease, or indeed any other malady affecting the throat. It was also employed for many other ills, and may still be so employed in the country districts. Originally the plant came from England, and after its introduction here the flowers gradually became a much paler shade of purple. In England it is also known as "carpenters' herb" for the reason that, when carpenters bruised themselves in any way while at work, they relied entirely upon a decoction of *Prunella* to cure the resulting inflammation. It was also used by the French, and the country people of that nation still have the saying that "No one wants a surgeon who keeps *Prunelle*."



THE FLOWER AND ITS PARTS

Fig. 98, the parts of an average flower, showing the five petals in its corolla; the five sepals composing its calyx; the pistil rising from the center, the enlarged base being the ovary, followed by the slender style and surmounted by the stigma. There are also four stamens shown, each springing from the base of the pistil, and each bearing at its upper free end an anther. Fig. 99 shows a stamen detached, with its double anther on top, from which the dust-like pollen is falling. Fig. 100 is the pistil cut in two transversely, showing the seeds within, while Fig. 101 gives the same sliced longitudinally, exhibiting the arrangement of the seeds. Fig 102 is an average flower sliced vertically through its center, and it shows three petals of its corolla; the section of the sepals of the calyx; the ovary containing two seeds, with the multiple styles of the pistil, and the stamens. Fig. 103: Some flowers are incomplete in that they have no petals (*apetalous*), and the one here shown is the flower of the *Anemone pennsylvanica*. Fig. 104: A flower may also be naked and yet perfect, as in the case of the Lizard's-tail, here shown. Fig. 105: Here is the flower of the Common Flax; it is not only symmetrical, but likewise perfect, regular, and complete, having all of its parts in fives; it is shown bisected in Fig. 102. Fig. 106, anterior view of a common Violet and Fig. 107, its five petals and five sepals dissociated. Fig. 108: An ovule or seed, when it is said to be suspended in the ovary,—that is, hanging perpendicularly from the summit of the ovarian cell. When situated as in Fig. 109, it is said to be erect, and in Fig. 110, ascending. Taken in the order given, these are the ovaries of the Anemone, the Buckwheat, and the Buttercup. Fig. 111 gives a cruciform flower (Mustard), and Fig. 112 its pistil and stamens removed and much magnified.



LEAF TERMS

Plants, such as the Iris (Fig. 113), present no distinction of petiole and blade, and on section their narrow leaves are arranged as in Fig. 114. In the Pitch Pine (Fig. 118) the three needle-shaped leaves form a fascicle or bundle; a short sheath surrounds this at its base, furnished by the thin scales of the axillary bud. In the Larch (Fig. 124) the arrangement is much the same, as it is, too, in the Spruce. Such leaves are called awl-shaped. Another kind are the scale-shaped, such as in the Arbor-vitæ (Fig. 115), Juniper, and the Cedars. Here the scales which represent the leaves are in great numbers, and they gain the required spread of surface in this way. Petioles that expand and flatten, thus taking the place of the blade, are termed *phylladia*, such as in some Acacias (New Holland).

The stipules present as many variations as the petioles, and their extremes are to be seen in the Pea, the Magnolia, Tulip Tree. In the first they make a conspicuous part of the leaf, while in the beans they are more or less minute. In the Cloves they are united with the base of the leaf-stalk (Fig. 117), while in the Prince's Feather (*Polygonum orientale*), Fig. 116, the stipules unite to form a sheath for the stem. The *ligule* corresponds to the stipule in some of the grasses, where the sheaths support the blade on their summit, and it occurs on its apex. There are two principal arrangements of leaves on the stem, alternate (Fig. 122) or opposite. When alternate, the single leaves spring, one after the other, from each joint (node) of the stem, and when opposite, there is a pair of leaves at each joint of the stem—one leaf of any of the pairs being exactly opposite its companion on the other side of the stem. When a circle is formed of three or more leaves about the joint as in the Bedstraw (*Gallium*), the arrangement is said to be of the whorled or verticillate variety. The rule is unerring which determines the place of a leaf upon the stem in the case of any plant; it appears at its pre-destined point with mathematical accuracy, and the special formula in any case holds true for all species in the vegetable kingdom. Figures 119-123 throw some light on these formulæ.

It is not at all likely, however, that it has been used in the present horribly destructive war in France.

When we come to study the leaves of the plants here figured in the cuts, as well as in those in previous articles, or, indeed, in trees and plants in general, it will have to be observed that never more than *one leaf* springs from the same point on the stem; but, should two arise from the same joint, they are always situated on opposite sides of the stem, the distance of half the circumference separating them. If there should be more than two, as in whorls, they are placed equidistant around the joint of the stem, being separated by one-fifth, one-fourth or one-third of the circumference of the stem from each other, depending upon the number of leaves. This assures their being at the greatest possible distance apart, and we never see two or more leaves standing side by side at the same joint, nor are they ever clustered or one above the other. Clustered or *fuscicled* leaves are shown in Figure 124 of the Leaf Terms to the present article; they represent leaves of an entire branch crowded into a fascicle. Trees of the Pine family should be closely studied to work out such problems as these.

Leaves do not make their appearance on trees and plants in a haphazard manner, but spring normally from points which appear on the stem with absolute mathematical precision. Their arrangement is uniform for the species, but not the same for other plants.

From this it is clear that the greatest possible divergence is where the *second leaf* is found on exactly the opposite side of the stem from the first one, with the third on the side opposite the second, and so on, and consequently over the first one, with the fourth over the second. Two ranks are thus formed, one on one side of the stem and one on the other. This, then, is the *two-ranked* arrangement. By varying the intervals or distances on the *spiral line*, it is easy to see how we also get a *three-ranked* arrangement, as well as the most common one of all, the *five-ranked*. It is very instructive to study these several arrangements on the stems and branches of the plants and trees we can collect.

In Figures 119 and 120 of the Leaf Terms on this

page, we have the *three-ranked* arrangement in the Sedge. The avrious arrangements are expressed by *fractions;* for example, if we find the formula to be $\frac{2}{5}$, which expresses the divergence of the *successive* leaves, the number of turns made by the spiral line around the stem is indicated by the numerator, while the denominator gives the number of leaves in each cycle, that is the number of perpendicular ranks. Passing through the series, we may even find a *thirteen-ranked* arrangement, as in the house leek, and its formula would be $\frac{5}{13}$. Ordinarily there are no arrangements known above $\frac{15}{33}$. The rule and symmetry of it is truly marvelous and known only to the comparatively few. Parts of it are too technical to be touched upon here; but it is well to remember one thing: leaves do not spring out on plants and trees everywhere and anywhere. Each leaf arises at a *predestined point,* and the entire foliage appears according to a rule, which has been shown to be based upon principles involving the greatest possible mathematical accuracy.

The spiral arrangement is shown in the Leaf Terms in Figures 121-123, where a line is drawn through the insertion of the ascending spire of leaves, and so winds spirally around the stem; in the same species of plant there will always be the same number of leaves for each turn around the stem. "That is," says an authority at hand, "any two successive leaves will always be separated from each other by just an equal portion of the circumference of the stem. The distance in *height* between any two leaves may vary greatly, even on the same shoot, for that depends on the length of the *internodes* or spaces between each leaf; but the distance, as measured around the circumference (in other words, the *angular divergence,* or angle formed by any two successive leaves) is uniformly the same."

NEW YORK'S FOREST WEEK

FOREST week was celebrated at the Lake Placid Club September 4-8 by the New York State Forestry Association. The program included a series of indoor and outdoor conservation gatherings, for which a picturesque prelude was afforded by an Indian Council Fire, held under the auspices of the association in co-operation with the Conservation Commission, the State College of Forestry, the forestry department at Cornell University and the Lake Placid Club.

Among the features of the week were a five minute pagan sermon in the language of the Senecas, by Chief Sosondoa, (Edward Cornplanter) and Indian legends and fairy tales by the official story teller of the Iroquois, Yehsenowehs, (Miss Mabel Powers), in costume. An address was made by Charles Lathrop Pack, president of the American Forestry Association. Other addresses scheduled were:

"The New York State Forestry Association," President Herbert S. Carpenter; "Forest School Education for Boys," Professor L. H. Somers; "Forestry Work of the Delaware and Hudson Railroad," H. R. Bristol; "Wild Flowers of Forest and Field," H. D. House, State Botanist; "The Palisades Interstate Park," Dr. Edward L. Partridge; "Forests and Birds," Professor A. A. Allen; "Food Producing Possibilities of Our Inland Lakes and Forests," Professor F. F. Moon; "The Profession of Forestry," Professor R. S. Hosmer; "Conservation in the Adirondacks," Commissioner George D. Pratt; "The Timberland Owner and the Great War," Professor A. B. Recknagel; "A National Capital Forest," W. M. Ellicott; "Forestry and the Newspapers," Royal J. Davis, of the New York Evening Post; "The Forest Parks of New York State—The Motorists' Mecca," Eugene M. Travis, State Comptroller; "Water Storage in the Adirondacks," a paper by John G. Agar, President of the Association for the Protection of the Adirondacks, presented by Edward Hagaman Hall, secretary; "Forestry and Education," United States Commissioner of Education P. P. Claxton.

INDIANA'S FORESTRY WORK

IN advocating greater attention to reforestation the Indiana State Board of Forestry calls attention to the United States Geological Survey's estimate that at the present rate of consumption the coal supply will be exhausted within 50 years. It is pointed out that thousands of acres have been cleared that should not have been cleared and that no warring foe ever threatened more certain destruction than does neglect to conserve natural resources. The people are urged to sow now that they may reap in the future.

For this year's Indiana state fair particular attention has been paid to the forestry exhibit. Under the management of President W. A. Guthrie and Secretary Richard Lieber, of the state forestry board, the exhibit was made possible by generous aid from the state and the United States Forest Service, with the willing assistance of lumbermen and manufacturers of wood products. One of the features is a working model showing the erosion of land. This illustrates how the forests on steep hillsides conserve water supply and feed springs, wells and rivers. It also shows how the same hill, when cleared, becomes washed and does not produce enough to pay taxes. In the exhibit of native woods is included a sample of every variety of tree indigenous to the state. Other exhibits include colored photographs of birds, with a chart to show the percentage of insects and weed seeds entering into the diet of the birds. Forest fire effects are shown in specimens of trees damaged by fire.

TURNING A DESERT INTO FERTILE SOIL

BY ROBERT H. MOULTON

ONE of the most remarkable examples of soil transformation to be found anywhere in the United States is on the farm of Mr. A. N. Abbott near Morrison, Whiteside County, Illinois. In six years Mr. Abbott has accomplished the seemingly impossible task of turning some seventy acres of sand, formerly as barren as the Desert of Sahara, into a flourishing forest. Nor is that all; for this forest, acting as a sandbinder, has been the means of saving other fertile acres from the inroads of the drifting sand, the total result being that Mr. Abbott's farm has increased several times over in value. The sandy tracts, which before being planted to trees were practically worthless, are now worth anywhere from fifty to one hundred dollars an acre. Mr. Abbott's farm lies on the edge of the so-called River Bottoms, three or four miles east of the Mississippi River. When in geological ages the channel of the Mississipi was changed, the sand in the old river bed was blown up on the east side of the river, forming many sandy tracts. In time these tracts became covered with a sparce growth of grass. Then in a dry season the grass was killed, and the sand began to blow about, covering everything in its course. Such was the situation when Mr. Abbott came into possession of his farm.

SHOWING HOW A TRANSFORMATION IS POSSIBLE

In the background may be seen a tract of barren sand; in the foreground is a tract formerly without a trace of vegetation on which grass is now growing because of the protection of the line of trees in the middle distance. To the right is part of the forest plantation.

THE ONE REMAINING BLOW HOLE

The trees in the background protect the corn field beyond. Note how the wind has scooped out the sand. This is part of the original seventy-acre tract of sand on the Abbott farm.

Being something of an enthusiast in afforestation, Mr. Abbott determined to attempt the reclamation of the sand tracts on his farm. He was encouraged in the belief that trees could be

SIX YEARS AGO THIS WAS A BARREN BLOW HOLE

Since then the planting of black walnuts, locusts and cottonwood, together with a luxuriant growth of grass, has quite transformed its appearance.

made to grow there by the presence of one huge cottonwood tree standing almost in the middle of the tract. This tree also suggested the species which would most likely thrive in the sand. He also decided

TREES PLANTED IN SAND AT END OF A BLOW HOLE

These trees, cottonwoods, are now seven years old and act as perfect sand binders. The grass is beginning to creep into the sand in front of the trees.

to try the black locust, since, like the cottonwood, it has the faculty of storing nitrogen in the soil through the ministration of the bacteria on its roots.

The first year Mr. Abbott planted 5,000 yearling trees, and in a little over a year they were three or four feet high, and grass began to creep in between. In another year they had successfully checked the blowing of sand in their immediate vicinity, thereby protecting growing crops on other land nearby. He then went into the business of tree planting on a huge scale, planting about 70,000 trees altogether on some

THIS TREE GAVE THE PLANTER HIS IDEA

This large cottonwood was the only tree on a seventy-acre tract of sandy soil when it came into possession of A. N. Abbott, and it gave the idea of planting other trees in the effort to reclaim the sandy wastes.

70 acres of land, or at the rate of 1,000 trees per acre, the spacing being about 6 by 7 feet. The yearling plants were bought at an average price of $5 per thousand, and the cost of planting them was relatively

small, since two men could easily plant 3,000 trees a day.

The rapidity with which the sand drifted in many places is well illustrated by some of the accompanying photographs which show the original fence posts, set before the tree planting began, almost entirely covered.

Mr. Abbott has allowed one blow hole to remain unplanted, merely for the purpose of showing other farmers what can be accomplished in the way of reclaiming sandy tracts of land. This blow hole also shows in a manner most unmistakable how the trees serve to lower the temperature. On the day these photographs were taken, in mid July, a test of the temperature in the blow hole indicated 115 degrees Fahrenheit (it has been known to go as high as 150 degrees) while over among the trees it was only 95 degrees. This difference was due, of course, to the fact trees drink in and transpire an enormous quantity of water, and this giving-off tempers the dryness of the nearby atmosphere. It is also a known fact that moisture-bearing currents of air are caught by forest areas as they are not by the heated plains.

THE LE CONTE OAKS

THE noble old liveoaks which flourish on the campus at Berkeley are one of the chief prides of the University of California. Wishing to pay tribute of love and honor to Joseph and John LeConte, distinguished as scientists and beloved as teachers, a class dedicated to their memory one of the finest of the old oaks on the campus. These two brothers were born in Georgia, of old Huguenot stock, were professors in South Carolina College, and at the close of the Civil War went to California, where John LeConte became Professor of Physics, and later President of the University, while Joseph LeConte became Professor of Geology and Natural History. Although in the forties a pupil of Louis Agassiz at Harvard, Joseph LeConte was one of the first scientific men in America to maintain the truth of evolution. He served as President of the American Association for the Advancement of Science and as President of the Geological Society of America and when he died, in 1901, he left behind him many volumes of writings on geology, evolution, and many scientific papers.

Recently the University of California has had all the oak trees on its campus thoroughly cared for by the methods of modern tree-surgery, under the direction of J. W. Gregg, Professor of Landscape Gardening and Floriculture in the University.

The 520-acre campus of the University of California possesses a wealth of native California trees, shrubs and flowers. During the past five years the hill lands of the University, including the watershed of Strawberry canon, have been planted by the University with approximately a hundred thousand trees of many hundreds of species, the work being done with careful consideration of the purposes of the landscape gardener, the botanist and the student of Dendrology and Sylviculture. The University of California within the last three years has developed a notable Forestry School, headed by Walter Mulford, formerly Professor of Forestry at Cornell, the department including also David T. Mason, Professor of Forestry, and Woodbridge Metcalf, Merritt B. Pratt and Donald Bruce, Assistant Professors of Forestry.

THE LE CONTE OAKS, UNIVERSITY OF CALIFORNIA

Forestry for Boys and Girls

by Bristow Adams

ONE TELLS OF THE ADIRONDACKS

BOYS and girls, big and little and young and old, have written to me about the stories here set down. One says she likes them, another wants to know where I get my twisted history, and another tells me about my foolish notions on some other point. Mainly the letters have told that the readers like to know of the children about whom I write, or that other children have learned to look for interesting facts in forestry.

ONE boy, sixteen years old, has put down what he learned at first hand about forestry in the Adirondacks, the wooded mountains in northern New York. He went up there last year as a boy scout, to help protect those forests from fire, and to do his part in building trails into the wilder parts of the mountains. What he saw and heard he has written; and because it seems good to me I am passing it on to you.

This year, boys of his age have worked in garden and grain field; their camps have been headquarters for farm labor rather than for the more pleasant and more exciting work in the woods. All of us have had to do what we could to help the food supply; next year we shall have to do even more. I am hoping that there will be built up a habit of work, and that many Americans will get away from the present plan by which they "let George do it."

This boy who wrote about the Adirondacks is Beverly Galloway, and his father knows about all there is to know about plants. The first thing that strikes Beverly about the Adirondacks mountains is that they form one of the largest pieces of wild woods in the country, and that they are in the same state that contains the largest city in the world. He tells how they first became known, through the discovery of deposits of magnetic iron. "A number of these mines," he says, "were worked in the hope of getting good rich ore, but they never amounted to much. Many people went there to help develop the mines, so when the mines failed, the workmen had to find other ways to make a living.

"FARMING was out of the question; the region was too rocky, even if the forest were removed. The forest was there; why remove it? Possibly it could furnish a means of livelihood. Indeed it could, as they soon found out. Within its borders were many creatures which could be trapped during the winter for their furs, or shot all-the-year-'round for their meat. And there was the forest itself. So the two industries of trapping and lumbering were started. Since new traps and other supplies had to be obtained from the outside, a means of traffic was started. As the output of the region grew, so did the traffic grow. But the lines did not go into every nook and corner of the mountains, but were main roads going north and south. So we have the Adirondacks of today,—easy to get at in a general way, yet with large portions out of the usual lines of travel. There are only a few railroads open to the general public, but a great number of private logging roads and railroads.

"Recently with the coming of the au-

tomobile there have come some good roads. But here again, as in the case of the railroads, the heart of the Adirondacks cannot easily be reached.

"AT FIRST only a few persons came in for vacations. These usually came during the hunting season. The next year they would return with friends. In this way the fame of the Adirondacks spread abroad. Hunting led to fishing, so the sportsmen not only came in the fall but also in the spring. Some of those who came in the spring stayed later and found that the summer climate was better than the 'lumber-jack' painted it. Then came summer hotels.

"These summer hotels are now to be found in nearly every place that is easy to get at. And since this mountain region is also a lake region, the ways of getting about were simplified. Now, in nearly every place where there are boats there are also guides, whose rates are from four to seven dollars a day. At first these rates seem high, but they are truly not so. Where in any city could one get a man who would paddle a canoe—provided there were places for a canoe to go—and paddle it for thirty miles, carrying it and all the baggage too over portages, make the camp and cook the meals, find fish and game, and keep one from being drowned or shot for a deer, all for seven dollars a day?

"THE lumber industry is still a big one. The old method of lumbering had to have the winter's snow. Roads were made to tap the heart of the best timbered country, and followed the lower and more level ground. These roads were as free from bumps as city asphalt streets. When the first freeze came they were sprinkled with water; after several sprinklings and freezes they were covered with a layer of ice some inches thick. Heavy loads could now be hauled on sledges over these ice-ways with very little trouble. Even now the traces of these old roads may still be seen, leading from the heart of a pine section to some water course.

"WHEN the sawlogs had been cut and hauled to the banks of a stream they were piled at the edge of the water, or on the ice, with the log ends easy to get at. The marking was simple. On the end of a sledge hammer were raised letters, these letters being the 'trade mark' of the company doing the lumbering. When a log was to be marked its end was hit with the hammer and the dents left were the reverse of the letters on the hammer. By this it will be seen that the letters had to be made wrong-way-'round, or mirror-wise. After the logs had been driven down stream on the spring freshet to the mills below, every owner was able to claim his own logs.

"Now there are very few of these spring drives. The logging railroad has taken the place of the river, although horses are still used in skidding the logs to the rollways. At the present rate, unless some measures are taken to start new trees the supply in the Adirondacks will run short in something like twenty years. It takes time for trees to grow. They are not good for paper until they are twenty or

(Continued on next page)

FORESTRY FOR BOYS AND GIRLS

Continued from Preceding Page

thirty years old, and must be over fifty years old before they make good lumber. A beech and birch will take twice as long, and are not made into paper at any stage.

"On State land the lumber must not be cut. Fish and game are protected by state and federal laws well enforced by wardens.

"The forests are protected from fire by lookouts, wardens and guards. At present there are not enough guards to stop large fires that may get started, so the people have to turn out and become fire-fighters to save their property. Outside of the State lands little has been done to renew the forest; but any who wish to take the time and trouble to plant may get young trees from the State, and a few have undertaken to replant. When all do this the future of the Adirondack forests will be sure."

Thus ends Master Galloway's story of the Adirondack region. Some day, as a forester, he may look back on what is, as far as I know, his first printed work on the subject. Looking back at it as a grown-up, will he think, as I do, that he found out a great deal, or will he then decide that he knew very little in the light of all the things he has learned since?

THE POISONOUS CICUTA

MANY deaths, both of human beings and domestic animals, are caused every year by cicuta, or water hemlock, a poisonous plant. It is the most violently poisonous of temperate region plants, yet it is not generally recognized. Cicuta is widely distributed. Unfortunately, it resembles a number of harmless plants and is not easily recognizable. It belongs to the same family as carrots and parsnips. It has a number of popular names, of which the most common is "cowbane," or "water hemlock." In the mountain regions of the West it is frequently called "parsnip," or "wild parsnip." Other names, less common, are "snakeroot," "snakeweed," "beaver poison," "muskrat weed," "spotted hemlock" and "spotted parsley."

The plant grows in wet places and is especially common in some parts of the West along irrigating ditches. It has a thickened rootstock with roots which sometimes takes the form of a group of tubers. The cicuta is most readily distinguished from plants of similar appearance growing under the same conditions by the transverse chambers in the rootstock. Further description, except by botanical terms, is difficult.

Only the root of cicuta is poisonous. Cases of poisoning are more frequent in the spring, partly because the roots are more likely to be noticed at that time and partly because they appear to be more poisonous then than later in the season. Occasionally stock find the roots when they are washed out by high water in small streams. Farmers in their plowing sometimes bring to the surface a considerable number of roots and these are eaten by cattle, with resulting sickness and death.

SPRUCE FOR AEROPLANES

CAPT. DE LA GRANGE of the French aviation corps, says that Uncle Sam's greatest aid to the allies can be accomplished by aeroplanes, built of American spruce, of which large quantities are being shipped from the forests of the Pacific Coast both to American and English manufacturers. He says:

"If the Government wishes to, before the first of April, 1918, it can have a tremendous aero fleet. Suppose it decided to have only 5,000 planes and 10,000 motors. In order to keep that number of aeroplanes always at the front it will be necessary to build 2,000 planes and 4,000 motors per month, viz, 18,000 planes and 36,000 motors during the next nine months. Therefore, between January 1, 1918, and December 31, 1918, the United States must build 22,000 planes and 46,000 motors. This means a great effort on the part of the American factories. They can make this effort, as they have already the buildings, the workmen and part of the machinery needed. They have also a large number of the best scientists and technicians. The size of the orders given them will insure obtaining the money necessary to organize the plants for their construction."

Photograph by G. T. K. Norton

A FAMILIAR SIGHT TO WASHINGTONIANS

THIS "house" stands on the lawn or mall of the Department of Agriculture, Washington, D. C. It is made of a hollowed section of a red cedar and was first exhibited at the World's Fair; in pieces it was brought to Washington and set up, when the roof was added. It is sixteen feet in diameter; the lower portion is used for the storage of gardener's tools, while birds by the hundreds live in the upper story. The whole is a rich, dark red and is ivy-grown, and forms one of the most attractive bits of wildness in the city. The dome of the New National Museum building is seen on the horizon at the left.

OUR SNAKES A NATIONAL ASSET

BY GAYNE T. K. NORTON

THE fear of snakes, or to speak more exactly, the very general tendency to kill snakes on sight, is as universal as war. Some people associate the fear with mythology; others blame the misinformation that has been spread for generations. This state of affairs has existed—with disastrous effects to the snakes and injurious reactions upon ourselves — principally, I believe, because editors have not seen fit to change it. They have reasoned, and correctly, that the public, with few exceptions, would rather not be educated in herpetology.

With this summer, however, the millions of war gardens have given the snakes popular interest—a "news angle" editors must consider. The gardens are bringing outdoors many people who ordinarily would not tread from the paving blocks. Tremendously increased tillage is bringing people and snakes together.

Unless much educational work is done the number of snakes that will be killed by the well-meaning but misinformed gardeners will be very large. Our snakes, and we are rich in reptile life, are a national asset worth many millions of dollars. Snake killing will never become a national issue—conserved as an economic factor, destroyed as a menace—yet the snake, particularly at this time, should be conserved. The relation

THEY KNOW AND DO NOT FEAR SNAKES

A group of hunters with some pet snakes from private collections. Allen Samuel Williams, founder of the Reptile Study Society, is seated in the foreground.

A CHARMER CHARMED

A khaki clad, soft shirted hunter who had never touched a snake until five minutes before the photograph was taken.

WITH THEIR PET SNAKES

Allen Samuel Williams (left) with a large pet pine snake. Mr. Williams is an eminent herpetologist and naturalist, an authority on the American Indian, and a well-known author and lecturer. His knowledge of the ways of the wild things verges on the uncanny. He is perfectly fitted to lead the boys in the work of snake conservation. The writer is holding a large bull snake, another pet caught by Mr. Williams in the South.

Photograph by C. T. K. Norton,
by courtesy of New York Zoological Society.

A REAL "SNAKE CHARMER."

Gladys Ditmars is a born zoologist; she is the daughter of Mr. Raymond L. Ditmars, reptile curator of the New York Zoological Society. Gladys has traveled much with her father and absorbed much of his wisdom. She goes out of her way to save a snake's life. The king snake photographed is a pet she caught in southern New Jersey.

it bears to successful crops is important—more important than even the average farmer realizes.

Reptiles may not manifest friendship toward us, few would welcome such a condition, yet they are not enemies. They never attack unless in self-defense. Of our 111 species but 17 are poisonous—two species of Elaps, coral snakes, and 15 species of Crotaline snakes, the copperhead and moccasin, the dwarf and typical rattlesnakes. On the other hand the help they render is valuable. The pests destroyed each year, especially the rodents that injure crops and carry communicable diseases, roll up a large balance of good service in their favor.

Rodents are destroyers of farm products, cause loss by fire through gnawing matches and insulation from electric wires and of human life, through germ carrying, particularly the bubonic plague. Before the war the United States Department of Agriculture placed the bill at $500,000,000, one-fifth of which equals the loss of grain. With advanced prices this is increased.

They also destroy eggs, young poultry, squabs and pigeons, birds and young rabbits, pigs and lambs. A loss to husbandry not estimated in figures but realized as extensive is due to the killing of fruit trees by girdling or other injuries to the bark by species of wild rodents. Eminent medical authorities agree that many plagues can be accounted for by rodents. As a destructive agency the rodents have no rival.

The explanation of the big figures representing damage from the rodent is due to the vast numbers of those small animals owing to the characteristic fecundity of the species. One investigator paired two common house rats late in December. By the middle of the next September he had 880 rats.

Reptiles are a very important factor in the natural work of restraining the too rapid increase of rodents. Practically all our snakes feed largely upon rodents. One in particular which has a wide range is the *Lampropeltis*

AN OLD TIMER AND A RECRUIT AT SNAKE HUNTING

George Von Buehren (left), an ardent herpetologist of many years' experience and owner of a very unusual collection of serpents, is really not the sort of chap the photo makes him out to be, and Frederick Beebe, a new and enthusiastic recruit. George trusts the pine he holds, but Fred wants to see what the large gopher, or indigo, snake he has is up to. The gopher and king are the snakes which domesticate the best. They are both of great economic value.

doliatus triangulus (milk snake, house snake, spotted adder, checkered adder), which finds 90 per cent of its diet in small mammals. This reptile, together with dozens of others, is absolutely harmless, defenseless and in no way destructive, though many ridiculous tales are told about it.

The gross ignorance regarding our snakes causes slaughter of all things that wear scales and crawl. Farmers should protect and breed the harmless snakes rather than kill them. Many European countries have protective legislation. Another fact: all the king snakes, and the family is large, are natural enemies of other snakes and eat many of them. In numbers they probably overbalance the poisonous species and by general distribution usually occupy the same habitat as the dangerous snakes. In this way they materially help to lessen danger of poisonous snake bite. Until a person is able to immediately distinguish and name a snake, and know whether it is dangerous or not, that person has no right to kill any snake. Every time a snake is killed more damage is being done than good. I will not go into detail regarding the very interesting life histories of snakes, facts it will repay anyone to investigate, but will briefly mention the Reptile Study Society and the work it is trying to perform.

SOME HIGHLY PLEASED HUNTERS

These snakes were caught on the first hunt of the season and among them were DeKay's garter, swamp snake and many others. The hunters were very proud of their "bag."

Photograph by courtesy New York Zoological Society.

AFTER A GOOD MEAL

This shows a young king snake that has just eaten two sparrows, shown against the paper, and illustrates the economic value of snakes. During the hunts snakes captured would disgorge recently eaten food. Disgorged mice showed plainly their value right in the field. Such an instance was shown to a farmer who had told a group of hunters to take every blamed snake off the place. His views changed suddenly.

Founded a number of years ago by Allen Samuel Williams, scientist, author and lecturer, and now organized in many states, the Reptile Study Society is actively pushing an educational campaign to save the snakes. Practically all the leading zoologists are members, and the roster includes the names of many women. Juveniles form the class to which the most urgent appeal is being made. Hundreds of youngsters are being reached through the Y. M. C. A. and Scout organizations and the like. Energies are directed to correcting false popular beliefs.

Field meetings and hunts have been found the best medium. The boys, expertly guided and carefully watched, catch their own specimens. Fear is overcome by handling and explanation; proper catching methods are illustrated. Dangerous snakes are exhibited and studied; the treatment for poison bites is demonstrated. The boys are not allowed to handle these snakes and are warned regarding them.

The catching and handling brings a psychological condition, heroics, into the scheme and helps to make every boy a protector of snakes. The captured specimens are exhibited and many people are reached through them. This may not appear as a large field for service, but the good being done is surprising.

The Ditmars Club—boys of the Newark, N. J., Y. M. C. A.—has been very active. Two hunts, both well

attended and successful, held before May 15, netted many specimens, and the exhibit is attracting much attention.

A snake hunt, to phrase it mildly, is exhilarating. Quite naturally the sighted snakes resent capture and provide thrills a plenty. Hands and forked sticks do most of the catching. Often, indeed, are the hunters bitten—just scratches that hardly break the skin, clean and painless—but these seem to have a paradoxical effect; they diminish rather than increase fear.

The boys have taken to snake hunting like ducks to water; but they do not hunt—they ransack. A swamp is approached and half surrounded with cold-blooded efficiency, then it is combed from end to end; in squads with a leader they spread out and nothing alive escapes. No regiment could attack trenches with more vim and determination than the youngsters bestow upon old stumps and rotting logs. Literally no stone is left unturned. And a glance backward at the country hunted gives evidence of the battle waged.

Up to their knees in mud and ooze they will collar a banded swamp snake, *Natrix fasciata sipedon,* as long as themselves and bring it in; swimming avails the reptile nothing; on a sunny upland they will race a blue racer, blacksnake; it will have no chance to find a hole—a tail in sight means a snake in bag every shot. Even the evil-looking and bad-acting hognose, the stubby, slow-moving snake that hisses loudly and flattens out when disturbed, the much-feared but altogether harmless "adder," the bluffer of the snake kingdom, is shown no consideration — merely and unceremoniously bagged, hisses and all. It is characteristic of boys to do anything as hard as it can be done.

Milk snakes, several varieties of garter snakes, ribbon and De Kay's snakes have all been captured by New York and New Jersey members. The value of these snakes is very distinctly, though a little unhappily, demonstrated. Our hunts took place in early spring, but a short time after the end of the winter hibernation. The snakes were hungry; nearly all that we caught had recently eaten. As is always the case, capturing or handling a snake shortly after it has eaten will cause it to disgorge any food it may have taken. Numbers of our specimens, even while talks were being given on the subject, disgorged the partly digested bodies of small rodents.

Indirectly in this way several farmers were "shown." They would ask us what we were looking for on their land. Our reply would give us "the run of the place. Take every bloomin' critter y' see." We took the trouble to talk and illustrate the value of the snake to these men and in every case their ideas immediately changed. In one instance the man finally replied, smiling: "Well, if that's the case, guess I want all my snakes and I'll have to ask you gentlemen to move on." And another in our presence called his five sons from the house and told them to give the snakes a chance.

The older and more experienced herpetologists have brought in copperheads, *Ancistrodon contortrix,* and timber rattlers, *Crotalus horridus.* About every specie of snake in this section is represented in one or more of the society's collections. Turtles, frogs, toads and a rather complete collection of local salamanders, including a round dozen species, are also in the exhibits. Many snakes not found nearby are also in the collections, pine and king snakes, green snakes and boas.

All of these private collections are interesting; one contains the ugliest snake, another a sort of misfit, a swamp snake with rusty skin instead of the usual dark, faintly marked back; a five-foot snake caught by a four-foot boy, and so on. The value of these collections is great; they not only give their owners certain responsibility, but are talked about and widely viewed.

To visitors the boys enjoy "showing off," so, indirectly, taking the fear from other people; they "dare" visitors to handle a snake and, when once acquainted, the dislike and repugnance disappear. To the writer it is always a source of wonder to see how quickly the snake wins friends. My own fear vanished in five minutes. It would seem that unjustified prejudice accounts for the snake's unpopularity.

The most interesting of these private collections is owned by George Von Buehren, who lives at an apartment on Southern Boulevard, New York City. All the serpents found in this section of the United States are represented. He lives alone with them and no mother's proud young hopeful could be in better condition or have more painstaking care. Many of the specimens he has had for years; many he has reared from eggs or seen born. All are very tame and a few seem to show slight intelligence. At present he has 30 odd specimens, including a young, perfect boa.

ANTS IN GARDENS

GARDENERS who are worried about ants in their gardens may be interested in the statement that ants in gardens do not as a rule cause as much injury as their numbers would indicate. They feed only to a very limited extent on growing vegetables. Many of them feed on the honeydew secreted by plant lice and their presence is often an indication that the plants are infested with these insects.

In case it is found that the ants are actually injuring the plants many of them may be killed by injecting into their nests kerosene, gasoline or carbon bisulphide. In the case of small nests the liquid may be applied with a small oilcan. About an ounce should be injected into each opening. In larger nests the opening may be enlarged with a sharp stick and a greater quantity of the liquid used. After the liquid has been placed in the ants' burrow the opening should be closed with earth and packed down with the foot. In case of large ant hills it will add to the effectiveness of the treatment if an old rug or wet gunny sacks are placed over the hill to hold in the fumes. Some of the ants may escape and start new colonies. It is therefore usually necessary to go over the garden several times and treat new nests when they become noticeable.

FORESTRY AND THE WAR

From An Address By President Charles Lathrop Pack, of The American Forestry Association, At the Lake Placid Forestry Meeting, September 6, 1917

IT is an unusual pleasure to be the guest of the New York Forestry Association and other representative institutions here today in beautiful Lake Placid. I bring you all the greetings of the directors of the American Forestry Association—an Association of constructive interest in fundamental and progressive forestry with members in every state and territory of the Union, an Association whose membership has doubled even in wartime.

We stand for all that is best in forestry. We wish the New York State Forestry Association and the others here represented God-speed in the splendid work you have in hand. We foresters and lumbermen have an important work to do in war time. The forests of America are increasing in direct and potential economic value and importance on account of war. Now that we are building hundreds of wooden ships, everyone thinks of the larger part lumber is to play in winning the war. There are many other war uses for wood. Take the matter of so-called "naval stores"—tar, pitch, resin and turpentine. These products are essential to every navy and are particularly needful to a wooden merchant fleet. More than two-thirds of the world's supply of these things come from our southern pine forests. We have been wont to refer to turpentine and resin as "naval stores," but now resin is employed in great quantities in filling the space between the bullets in shrapnel shells, so that when shells explode the missiles will be evenly distributed in every direction.

We have sent many portable sawmills and their equipment and crews of trained men to our Allies to aid in overcoming the great shortage of lumber for nearly every war use. The peculiar style of warfare which the great war has brought forth necessitates the use of enormous quantities of timber for trench walls, for trench floors, for braces, shoring, and stays. Millions and millions of feet are required for building behind the fighting lines, for temporary hospitals, for housing non-combatants, for temporary storehouses, for railroad building. Enormous quantities of forest products go into mine props, bridges and for other military preparations. In all this, I have not mentioned what is in all your minds; the great amount of lumber used in building the cantonments and camps and storehouses used in connection with the army training in this country.

As some of you know, sometime since the War Department announced the organization of a regiment of forest engineers composed largely of forestry officers and hardy men accustomed to the ways of lumbering. Now we are told that there will be six of these regiments instead of only one. Some of the leaders of this great force are already in France, prominent among whom are Major Henry S. Graves, Chief of the United States Forest Service, and Major William B. Greeley, also of the Forest Service. We are told that other experts will also be commissioned to go forward with these new commands to France. Their work will be largely in the forests of France, providing all sorts of lumber and wood for the activities of our army at the front. While organized on military lines, the work of these regiments will be more largely industrial than combatant.

For one thing it has been announced that the American engineer forces with the army in France will have to construct a railroad from Bordeaux all the way to the fighting front to better facilitate the transportation of our troops and to better keep them supplied with all the necessities of war. The building of such a railroad in so short a time would even a few years ago have been considered a great engineering feat. Today it passes as only an incident of a colossal war.

A Committee of the Council of National Defense sometime since estimated that two billion feet of lumber from our forests would be used for purposes directly connected with the war during the year beginning June 1st last. This amount, it is evident, will be exceeded because of the new war necessities for the use of wood. It is now announced for one thing that a large amount of spruce, largely from the western coast, will be used in the construction of a great aeroplane fleet, the greatest fleet of the kind that has ever been constructed in so short a time. It is now thought that the war consumption of American lumber is likely to reach two billion, two hundred and fifty million feet for the twelve months. These new uses and the increased old uses for the products of the forests increase the economic value of the forests and add to the importance of all the questions you are here to consider.

I have an announcement that I want to make which will have, I hope, not only the approval of your minds but of your hearts also. The American Forestry Association, in view of the fact that the majority of those in the forestry regiments going to Europe are trained foresters, lumbermen and woodsmen, has decided to establish the American Forestry Tobacco Fund to provide them and the men of the sawmill contingents with such comforts in the way of tobacco and other things as they may require. My friends, the fact is we are going to do our duty in this hour of trial. This is as much our war as it is the war of England and France and Italy and we all want to do our part. I hope you will join with us in promoting the American Forestry Tobacco Fund that we may give some little satisfaction and comfort to those who are particularly fighting for us in France. We will all be glad of an opportunity to help look out for our own. Contributions should be sent to the American Forestry Tobacco Fund, Washington, D. C.

That we are going to win this war none of us doubts. To do this we must bend our every effort and utilize our every resource. Our timber is essential but our food is just as important. Every individual can help in fighting with food as well as with men and munitions. The production and conservation of food is within the reach of all of us. Former Ambassador Gerard has told us that we cannot starve Germany. Our common sense tells us that we must not starve our army or our allies. We are fighting for national existence and the perpetuation of Democracy.

THE BLUE MESA FOREST FIRE

BY HENRY L. SPENCER, Forest Ranger

THE season opened hot and dry on Blue Mesa. For thirty days no rain had fallen. The large expanse of Engelmann spruce, with its dense floor cover of down timber and underbrush, was thoroughly dried and awaited but a carelessly thrown match or cigarette stub to start the worst fire that had ever occurred in the Blue country.

Blue Mesa, in Gunnison County, Colorado, embraces the territory between Big Blue Creek on the west, and the Lake Fork on the east; and from the Black Canon of the Gunnison on the north to the north boundary of the Uncompahgre National Forest on the south; a stretch of country ten miles in width east and west, and fifteen miles in length. The upper half of the Mesa reaches up the easy north slope to the Uncompahgre Forest. This fine body of timber, unmarred by axe and saw, lies principally on the public domain, below the National Forest boundary, and contains about 200,000,000 feet, board measure. This timber is particularly susceptible to fires because of the large number of sheep outfits passing through it, and because it lies entirely outside of a National Forest and has no fire protection.

While on a trip over my district, on June 21, I received telephone word from Bill Doran, fire guard at my station, that there was a big forest fire below the Forest boundary, between the Little Cimarron and the Big Blue. Telephone messages came from other sources at the same time and all indicated that the fire was serious, and traveling rapidly toward the Forest. Enlisting Frank Carpenter, who had carried the news to Doran, I arranged to have the Alpine and Bally tool caches, a camp outfit and a supply of food packed to the fire that evening. Ranger Wagner, who had been my fire guard for three previous years, telephoned me that three automobile loads of men would be ready to start from Ridgeway by the time he could reach there from Jackson. I told him to get the men and come on, and I planned to pick up the first-aid crew from the lower Lake Fork and have a follow-up crew come in from Lake City and vicinity the next day. Arranging to have Tony Baker provide six horses at the J-J ranch the next morning, I started from Lake City in an automobile with a chauffeur. As our car rolled out of the town and around the shoulder of a mountain our eyes caught the huge cloud of boiling smoke from the fire. It was 20 miles away, as the crow flies, yet it seemed to be just over the brow of the Mesa.

On the hurried trip we gathered up all the men we could find at their homes and camps. During the night we abruptly topped a ridge, to see the red glow, toward which we had been traveling, suddenly give way to the countless bright lights of the fire itself. The first impression of such a sight is one never to be forgotten. Close your eyes and imagine thousands of brightly burning camp-fires set in the vast, black background of an inky night, and you will gain a faint idea of the wonderful panorama before us. Over a thousand feet of steep hillside, down to Little Blue Creek, which had checked the fire after its first furious rush, then up the slope on the other side and on south for an unknown distance glowed the myriads of bright lights. No conception of the area of the fire could be gotten other than that it was very large. My sense of the beautiful was dispelled by the thought of the morrow, and the days to follow, when the fire would awaken to the prevailing high day winds and do its utmost to level the Blue Mesa forests.

In making our way to the fire we had to bow our heads against the thickening smoke and as we worked onward I could see that if the fire should cross the parks through which we had traveled, and get into the heavy timber on the east, it would be beyond control and probably the greater part of the Blue Mesa forest doomed. Just before daylight we reached the camp of the men brought by Doran and Carpenter and with the first sign of dawn we started for the fight, with arrangements completed by telephone for camp equipment and commissary to be sent us. We were joined by Ranger Taft and Guard Lucas of the Gunnison Forest and Andy Enbom, a sawmill man, who had information concerning the northwest part of the fire area. We had already determined to fight it on the east and south, and their news confirmed our judgment. The wind was rising rapidly and the fire was responding in many places with high crown blazes. It was about seven miles around the outer edge but the weak places were on the east and south sides. During the day the follow-up crew from the Lake Fork arrived, with Ranger Wagner; Borden came from the Gunnison Forest and Sheriff Hanlon of Gunnison County arrived with ten men, camping on the north end. Wagner brought further reinforcements at midnight.

On the second day every effort was needed to combat the sparks that were carried over our lines by the high wind from the west. The situation was intensified as the fire burned closer to the lines and the spark danger grew greater. Within the fire area were many small patches of trees, which on account of topography and slight isolation had not been burned by the first afternoon rush, and as the fire crept into this heavy timber, high crown fires were started which

FIGHTING FOREST FIRE ON BLUE MESA, IN COLORADO

In the picture in the upper left hand corner of this layout is shown the place in which the fire started, and the timber to the south and east, where the fire fighters concentrated their work. The picture in the upper right hand corner shows fire equipment being packed to the scene on horseback. The round picture shows the camp made by the fire fighters. To the right of this is a remarkable view of the fire going up a spruce tree. The fire area contained a vast quantity of Engelmann Spruce and it was in the effort to save this and to prevent the flames from spreading that the fire fighters toiled. The tented scene beneath the round picture shows visitors at the camp of the fire brigade. In the picture in the lower left hand corner of the page is illustrated one phase of the strenuous work required in checking the progress of a fire in the mountain forests. The bags slung over the backs of the horses are filled with water, which has to be carried for a long distance for use in putting out fires in smouldering trunks and stumps. In the lower right hand picture is shown the floor of the forest after the flames had passed. The fire was a serious one and came near to dooming the greater portion of the Blue Mesa forest.

scattered sparks at an alarming rate. Sparks repeatedly jumped 600 yards across a deep canon to heavy timber. It was absolutely necessary to extinguish these sparks within a few minutes, since an unmanageable fire would result from one of them in a short time. About 3 o'clock in the afternoon the situation became so serious, during the burning of a heavy patch of big timber, that we called out the entire night crew and scattered its members through the heavy forest to the east of our line, patrolling for sparks. Several times we had narrow escapes from the fire getting outside our lines.

The morning of the third day did not develop the danger of the fire jumping our east line that had been present the first two days, and by noon it seemed that the worst hazard on this line had passed. The high wind was now coming more from the north. In the afternoon on a trip around the north and west sides of the fire area I found a heavy patch of 300 acres of Engelmann saw timber located between the fire and the rim of the Middle Blue. The fire had just eaten into the timber, perhaps an hour before I rode up, but was in the crowns and beyond reach by direct attack. Quick action was necessary. I rode through the burned area to camp, quickly got together a crew and returned with them. The thing which astonished and alarmed us was that the fire was traveling north in the face of the wind almost as fast as a horse could walk. The bulk of the timber lay to the north and it was this that we wished to save. A favorable place, where the heavy spruce gave way to a narrow strip of aspen running west, was selected and we began work. Our water bag was emptied in a short time, and as every man was needed on the line, Mrs. Patton, the wife of a sheepman, volunteered to go for water. Taking two water bags on her saddle she quickly rode three-quarters of a mile to a creek and returned with them full of water. We had men in camp who were much more afraid of venturing around and through the fire than this woman. We finished our line to the rim by sundown.

The next morning arrangements were made to move a camp with full equipment to the west side near the work. Ranger Taft returned to this location with us, and at his suggestion we decided to run a permanent control line up the hill through the heavy timber along the edge of the fire to "corral" it. The "corralling" of this part of the fire was perhaps the most spectacular work done on the job. Carpenter had departed at sun-up to get a gang of Swede timber cutters at Enbom's sawmill. They arrived at noon with a good skid team, five men and Mr. Enbom. By night, under Ranger Taft's direction, the line was well up the hill through the heavy timber. The situation on the east side still demanded the attention of most of our men and no attempt was made to continue the west side control line during the night. The work was resumed early the next morning by Taft and the Swedes. The wind rose with the sun and veered completely around to the southeast, and it was necessary to keep a constant watch for spark fires over the line. By great effort and remarkable endurance Enbom and his men outran the fire to the bare rim of the Middle Blue by a narrow margin. We had it "corralled," but with the wind from the south it was mighty liable to jump out any time. It did jump in several places, but was promptly caught each time, and after the fire had burned up to our control line and burned down, the Blue Mesa fire was under control.

FIGHTING THE PINE BLISTER DISEASE

THE results of scouting this year have shown that the pure blister disease is generally scattered throughout New England. In some localities currant and gooseberry infections are few and far between, but in the vicinity of pine infection centers they are heavily infected. In Maine and New Hampshire reports of 90 per cent infection of currants and gooseberries were made for several localities as early as the latter part of June. Many new infected areas of native white pines have also been discovered and the disease has reappeared at practically all of the points where diseased pines were found in 1916. Among the important centers of native pine infection found this year are Intervale and Conway, New Hampshire; Bath, Maine; South Royalston, Vermont; Bridgewater and Topsfield, Massachusetts, and Pomfret, Connecticut. The disease has been found on large and small trees; no white pines have been found to be immune, regardless of size or age. At Stratham, New Hampshire, more than 600 separate infections on twigs and branches were found on a tree about 3½ feet in diameter, 50 or 60 feet high.

About 400 men are engaged in blister disease work in New England. The work consists mainly of eradication of currants and gooseberries. Scouting in localities where the disease was not abundant last year is also being done to a certain extent and private owners of pine timber, as far as possible, are being educated in the means necessary to make their pine timber safe. Each state has selected one or more areas of varying size from which all currants and gooseberries, wild and cultivated, are being removed. These areas represent different environmental conditions, some having diseased pine, others none; some with an abundance of wild currants and gooseberries, others where these are scarce. All of these areas, however, have good white pine growth and by eradicating all the currants and gooseberries they can be made safe for the growing of pine.

The eradication crews are trying out different schemes

in order to find the cheapest and most efficient method of work. Each eradication crew must endeavor to improve its methods of work in every way possible. At present the general plan of work of the crews is as follows: The men are lined up 6 to 10 feet apart, and proceed back and forth over the strip of territory to be covered. The end man acts as guide and keeps the line straight. Tags, whitewash, paint, compass and breaking the underbrush are a few of the methods which have been tried by different crews to keep a line through the woods. Thus far the compass has been found to be by far the best and cheapest method where practical.

The tendency is for the members of the crew to work too far apart. For example, in one small swamp a crew working unsystematically reported finding about 100 wild currants and gooseberries. On going over the area in close formation the crew reported finding approximately 500 bushels additional. Most efficient results are obtained when the crew foreman acts as inspector and checks up the work of the crew all of the time. This statement carries no reflection on the efficiency of the individual members of the crew. Apparently most poor work is simply the result of an unsystematic attempt to cover the ground rapidly and thus reduce the cost per per acre.

Messrs. Stoddard and Moss of Connecticut have found by experiment that the best and easiest way to pull firmly rooted currants and gooseberries is as follows: One man pull straight upward; another man takes hold near the base of the plant and pulls at right angles to man number one. They claim this method makes the work quite easy and efficient.

In some states county agricultural agents have become interested in the blister disease and their aid has been of great value in assisting scouts in their work. They have also been of material assistance in arousing public interest. The aid of such organizations should be obtained whenever possible.

Massachusetts is taking a census of currants and gooseberries in each town. Work is also being started on a map to show the distribution of pine and currants and gooseberries in all of the Eastern States. The following classifications are being used:

1. White pine comprising half of stand or more
2. Scattered white pine of commercial value.
3. White pine present but of negligible value.
4. Commercial Currant growing areas.
4. Commercial growing areas.
5. Wild currants and gooseberries numerous.
6. Wild currants and gooseberries few.
7. Areas where skunk currants are found.

In co-operation with Ontario all currants and gooseberries on strips one and one-half miles wide along each side of the Niagara river have been eradicated by New York State to prevent the spread of the disease into New York State from Ontario. West of Connecticut and Massachusetts another strip about two miles wide was eradicated in 1916 to prevent the spread from the above mentioned states. This strip was gone over again this year to remove any remaining currants and gooseberries. Early in August several new currant and gooseberry infections were reported north and south of the terminating points of this line, but no infections have yet been found directly west of the line.

A general infection of considerable extent was discovered last year in the northeastern section of New York. Results of recent scouting outside of this area have shown that the disease is distributed from Lake Champlain well into the eastern portion of the Adirondack region. The line of western extension of the disease, as located by scouting to date, runs through Constable, North Bangor, Malone, Bloomingdale and Saranac Lake. Franklin county; and Lake Pleasant, Hamilton county. Infected currants and gooseberries have also been found at Chestertown, Weaverton and Warrensburg, Warren county; in the best white pine section of the state.

A previously unreported plantation of imported pine, from the Heins nursery, Germany, may explain the wide distribution of the disease in northern New York. This planting was made in 1903 or 1904 at Hurricane, Essex county, New York, not far from the locality where numerous diseased native pines were found last year and this year. This area of scattered native pine infection covers a number of square miles between Lewis and Cross, Essex county, and has been selected to demonstrate the practicability of controlling the disease. Eradication crews have removed cultivated currants and gooseberries and are now pulling up the great grandfathers of all wild gooseberry bushes. About fifty men are engaged in blister rust work in New York State.

Scouting is in progress in other parts of the State and a few isolated infections of planted pines have been found. Currants and gooseberries are eradicated in and around diseased plantations for a distance of approximately one-half mile. Near Geneva, New York, diseased pines were found in a plantation made in 1905 from stock purchased from a large nursery in Illinois. Currants and gooseberries were eradicated around this plantation last summer and very early this spring the plantation was scouted with extreme care and all diseased or suspicious trees were removed. The results have been very gratifying, as frequent inspections have been made and no currants and gooseberries outside of the control area so far have been found to be infected.

Diseased pines have been found in four places in Pennsylvania, but in each instance they were removed before the fungus had fruited. No diseased currants and gooseberries have been reported to date.

Scouting is in progress in New Jersey, but only one infection has been found. This was in a private nursery where the disease appeared last year. Hitherto New Jersey has been considered as being practically free from wild currants and gooseberries, but recently they have

been found rather abundantly in the northwestern part of the state.

Two specimens of diseased pine have been reported from a nursery located at Cuyahoga Falls, Ohio.

Scouting in Maryland, Virginia, West Virginia, North Carolina, South Carolina and Georgia has thus far revealed no blister disease. Planted pines in these states are not abundant, but scouting has revealed a larger number of plantings and a greater abundance of wild currants and gooseberries than was previously suspected.

The blister disease has been found on imported pine in a nursery at Pontiac, Michigan. These trees came from France in 1910 and all shipments from this nursery are being traced. A force of eight men are engaged in general scouting under the direction of Dr. Pennington, of Syracuse University.

A few currant and gooseberry infections found close together near St. Croix, Wisconsin, have been reported, but the source of this infection has not yet been discovered on pine. A force of 24 men are scouting the state.

More than a dozen infections have been found in the St. Croix valley, in Minnesota, scattered over a territory approximately 60 miles long and 10 miles wide. Several native pine trees and many currants and gooseberries were found diseased. Infections appear to be spotted over the valley and an attempt is being made to eradicate the disease on both pine and currants and gooseberries. Pine stock shipped from nurseries has been traced and several of these shipments were found to be diseased. Twenty-six men are engaged in scouting and eradication.

One tree on an estate located at Estelline, South Dakota, has been found diseased. The tree came from an infected Minnesota nursery in 1911 and illustrates the danger of spreading the disease through shipments of nursery stock.

Blister rust scouting is now carried on in Iowa, Illinois, Indiana, Missouri, Kentucky, Tennessee, Nebraska, Kansas and North Dakota, in co-operation with the various state authorities. Thus far this year no disease has been discovered in any of these states, although numerous plantings of pine have been found and examined.

Survey work in the Rocky Mountain and Pacific Coast States having native five-leaved pines has thus far revealed no evidence of the presence of the white pine blister disease. The rumor that the blister disease was found in the State of Washington is apparently unfounded.

A fungus having somewhat similar appearance to the white pine blister disease was found in Kansas in 1892 and in Colorado in 1897 and later. Inoculations by members of this office have practically proved that the rust on currants and gooseberries in Colorado is not the white pine blister disease.

Specific appropriations for the control of the white pine blister disease have been made as follows:

Massachusetts, $50,000, for 1 year; New Hampshire, $28,000, for 2 years; Vermont, $20,000, for 2 years; Maine, $10,000, for 2 years; Connecticut, $20,000, for 2 years; Rhode Island, $2,500, for 1 year; New York, $25,000, for 1 year; Pennsylvania, $10,000, for 1 year; Wisconsin, $15,000, for 2 years; Minnesota, $15,000, for 2 years.

The Federal Government appropriated $300,000 for the fiscal years 1917 and 1918, $150,000 of which is being expended on a dollar for dollar basis in the various states which have made appropriations for this work.

The present outlook for controlling the disease seems to center entirely on whether or not wild currants and gooseberries can be completely and economically removed and whether owners of cultivated currants and gooseberries prefer to lose their bushes rather than the pine. Professor E. G. Cheyney, Dean of the Minnesota Forest School, is engaged in a study of the eradication problem from every angle. He has suggested that in each demonstration control area data be secured this year for providing accurate information in the future on the effectiveness of control and the rate of progress of the disease outside of control areas. A rough topographic map will be made showing the distribution of pine by age classes, also showing type of area for currant and gooseberry growth, such as swamp, open meadow, brush land, pine woods, hardwood forests, etc. In the control area the record of these plants by species and amount of infection will be made, for each type, on permanent sample plots 50 feet square. Outside of the area several lines radiating from the control area will be run for some distance to provide check plots for determining the rate of advance of the disease.

NEW HAMPSHIRE CONFERENCE

UNDER the joint auspices of the Society for Protection of New Hampshire Forests and the New Hampshire State Forestry Commission, the eighth annual state forestry conference was held September 4 and 5 at Dartmouth College. The program included addresses by Governor Henry W. Keyes, Professor Filibert Roth, director of the forest school of the University of Michigan; Professor J. W. Tuomey, president of the Connecticut Forestry Association; Harris A. Reynolds, secretary of the Massachusetts Forestry Association; Allen Hollis, president of the Society for Protection of New Hampshire Forests; Dr. Charles H. Bolser, Professor F. A. Updyke, Professor James W. Goldthwait and Professor A. H. Chivers, all of Dartmouth; Elwood Wilson, forester of the Laurentide Paper Company; Dr. H. H. York, professor of botany at Brown University; S. L. DeCarteret, manager of the Timberlands Mutual Fire Insurance Company; Karl Woodward, professor of forestry at New Hampshire State College; F. H. Tucker, president of the Appalachian club; Mrs. A. H. Harriman, president of the state federation of women's clubs; E. E. Woodbury, Allen Chamberlain, Winthrop Packard and Frederick W. Kilbourne.

WESTERN QUAILS BEING EXTERMINATED

BY DR. R. W. SHUFELDT, C.M.Z.S.

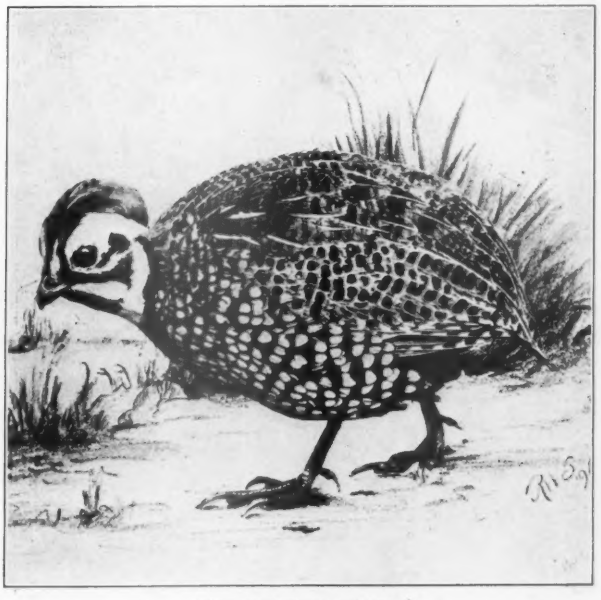
(Illustrations from Life by the Author)

THERE is no better evidence of the approaching extermination of any wild bird in nature, in any country, than the increase of the price demanded for it by ornithological collectors from year to year, when the skins of any species are offered for sale to museums, taxidermists and others. In 1830 the Great Auks were being cut up by the hundreds for bait by the fishermen, who frequented the fishing banks about the mouth of the St. Lawrence river; to-day, a single skin of that bird probably could not be purchased for a less sum than one thousand dollars. When Alexander Wilson wrote his American Ornithology, the Carolina Parroquet occurred in nearly every State east of the Mississippi, and its skin could be bought for a trifle; whereas now, as the result of eternal persecution and wanton slaughter, this species exists only in certain restricted sections of Florida, and its skin cannot be purchased for less than ten or fifteen dollars. In a few years it will bring double that amount.

THE PLUMED QUAIL

This handsome bird is found in Oregon, California and Western Nevada. It is a slaty-gray bird, overtoned with olive brown. It has black and olive feathers on the sides and is otherwise charmingly colored.

These two well-known examples are very fair ones as to what is going on along such lines all over the world, and other cases of it may be seen with respect to the Wild



THE MEARNS' QUAIL

This remarkable species is found chiefly in Arizona. The male here shown is spotted and barred with black and white, while other areas are in various shades of tawny and brown.

THE CALIFORNIA QUAIL

This bird is one of the most beautiful of all western quails. It is found generally in Oregon and California and also to some extent in Colorado.

MALE TEXAS BOB WHITE

This bird is the western quail which most closely resembles our eastern species. It is found no further westward than the southeastern corner of New Mexico.

Passenger Pigeon and the Labrador or Pied Duck, described in the February (1917) issue of AMERICAN FORESTRY, where figures of both species are presented.

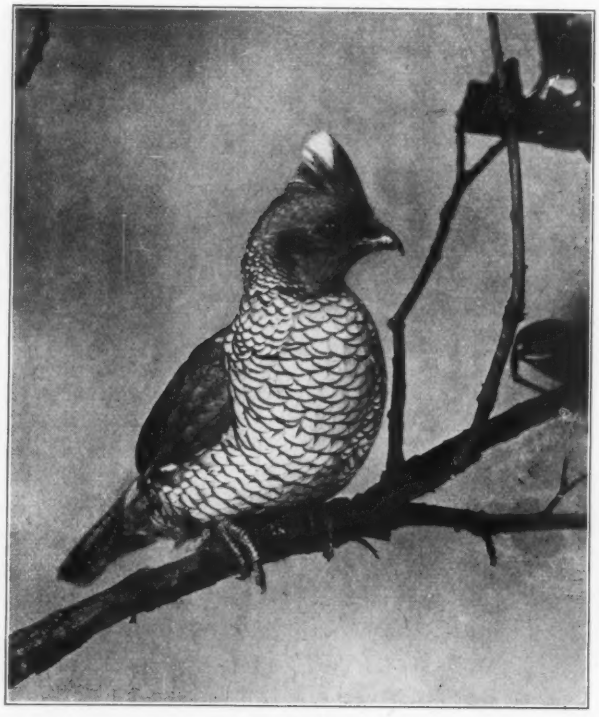
More or less suddenly it will be observed that a certain species, or several species of birds are becoming less and less abundant every year, be the cause what it may—known or unknown. Museums and collectors then get busy, and the very movement put on foot to satisfy the demands of such sources materially increases the danger of the extinction of the species sought.

This critical stage seems to now have been reached in the case of all the beautiful species of quails found throughout the Pacific Coast region. I can well remember when, fifty years ago, those returning from that region, in the early days of California, reported the presence of several of the species here shown in the illustrations in vast bevies, often numbering several thousand each, such hosts occurring wherever the nature of the country suited them. At the time to which reference is made, millions of these birds were to be found in California alone, and they were equally abundant in adjacent regions. But the gunners and hunters got after them in ever-increasing numbers, with constantly improved weapons, until the usual result was brought about; so that, at the present time, the various forms being considered are, with ever-increasing rapidity, confronted with the same fate that man had in store for the Wild Passenger Pigeon and the Great Auk. Already the prices for the skins of these several species are being advanced in the market for museums and collectors; and this, as pointed out above, is a very ominous sign for these most beautiful members of their kind in any part of the world. There is but one remedy for this very undesirable state of affairs: to pass laws against the shooting, trapping or otherwise destroying any of these species for a long period of years.

Of course, sportsmen will protest vigorously against any such legislation; but the only way to save the quails of the Pacific Coast is to stop shooting them. The birds in mind are all generically represented in this article. Our Bob-whites do not extend so far to the westward. To be sure, the Masked Bob-white occurs on the southern border of Arizona; but the bird that most closely resembles our eastern species is the Texas Bob-white, and that form is found no farther westward than the southeastern corner of New Mexico.

In so far as our own avifauna is concerned, there are, beside the Bob-whites, four entirely distinct genera of these western quails, and each genus contains, in addition to its type species, from one to three subspecies, there being about nine forms in all. In a brief article like the present one, it will be quite out of the question to give the descriptions, much less the ranges, where all of these truly beautiful birds are to be found at this writing; their photographs must stand for their appearances, and their habitats are not essential; the main object of this article being a plea to save them from certain and utter extermination.

Apart from Mearns' Quail I have had living specimens of all these birds in my possession for the purposes of photography, while the figure of the first-mentioned species was made from a mounted specimen in the collection of the United States National Museum.



THE BLUE QUAIL

This bird is also called the Chestnut-bellied Scaled Quail. It has a noticeably slaty blue plumage.

CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

There has been a serious depletion of the ranks of professional foresters during the past month, Millar, of the University of Toronto, and Benedict and Lafon, of the British Columbia Forest Service, having joined American Forestry Units going over seas. D. P. Brown, manager of the mills of The Brown Corporation at LaTuque, has gone to Scotland with a Forestry Unit, and his cousin, S. Brown, is going to Plattsburg to train.

Dr. B. E. Fernow and Clyde Leavitt spent a few days visiting Dr. Howe's Camp and discussing the work which it is doing in the investigation of cut-over pulp wood lands. They also visited the nurseries and plantations and some of the experimental lumbering operations of the Laurentide Co., Ltd., at Grand' Mere, and then went on to visit the Quebec Government Nurseries at Berthierville and the plantations on drifting sands at Lachute, both under the direction of Mr. G. C. Piche, Chief Forester of Quebec. Dr. Fernow remarked that the conditions in the lower part of the St. Maurice Valley were practically identical with those in the western Adirondacks.

On July 31st a meeting of the Quebec Forest Protective Association was held in Quebec, at which all the Fire Protective Associations were represented. Matters of general interest were discussed and a conference was had with Mr. Hall, the Chief of the Quebec Government Fire Service. A committee was appointed to see the Minister of Lands and Forests to urge him to make it obligatory for gum-pickers, berry-pickers, hunters and fishermen, not members of licensed clubs, and prospectors to obtain permits from the district fire rangers before going into the woods. The Minister was also asked to scrutinize more carefully applications for settler's lots, as the high prices for pulpwood were beginning to encourage speculators.

Mr. Avila Bedard, Assistant Chief Forester, is making a tour of the province, giving a series of lectures on forestry and forest protection in co-operation with the Canadian Forestry Association, assisted by Mr. Black, the Secretary. At Grand' Mere they had an audience of about 180 who much enjoyed the lecture and the excellent slides.

A conference was held at Grand' Mere on August 6, between Clyde Leavitt, Forester of the Dominion Conservation Commission, G. C. Piche, Chief Forester of Quebec, Dr. C. D. Howe, in charge of field work for the Conservation Commission, and Ellwood Wilson, to discuss the subject of the investigation of the condition of cut-over pulpwood lands and the best manner of handling them and also the best method of regulating the cut. The

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whole question of a supply of pulpwood for the future is of vital importance to the Provinces of Quebec, Ontario and New Brunswick, and the large increase in consumption makes it necessary to plan for the future. Heretofore and at present the cutting is regulated simply on a diameter limit basis, and this has by no means fulfilled the purpose which was intended. The operators have always gone along on the comfortable assumption that uncut lands were producing so much additional growth each year that enough trees were being left under the diameter limit system to insure a cut for the future and that the supply was practically inexhaustible. The sudden rise in price of wood has compelled them to give a little thought to this matter, and it is hoped that the present study being made will give us a sound basis on which to discuss this question and will lead to the obvious improvements in cutting and handling of timber lands which are necessary. Lumbering practice has not kept pace with mill practice and has not yet availed itself to any very great extent of the discoveries of modern forestry and engineering.

P. Z. Caverhill, in charge of forest surveys in New Brunswick, has resigned to go back to the British Columbia Forest Service and his place has been taken by G. H. Prince. This survey is beginning to open the eyes of the New Brunswick Government and it is hoped they will see the necessity for an up-to-date Forest Service. The stumpage dues of that province have just been largely increased and the lumbermen should demand an efficient management of Crown Timber Lands. New Brunswick should also reorganize its forest protection work and put it on an up-to-date basis.

Arnold Hanssen, for five years with the Laurentide Co., Ltd., after completing his two-years' course for the degree of Master of Forestry at the Yale Forest School, in one year, has enlisted in the Royal Army Medical Corps and is training at the Valcartier Camp.

The figures for the consumption of pulpwood for the year 1916 have just been published by the Dominion Forest Service and show a large increase over 1915. The total consumption for 1915 was 1,405,836 cords valued at $9,426,217.00, and that for 1916 was 1,764,912 cords valued at $13,-104,458 00. The increase in the year in the price per cord was seventy-one cents. The increase in the consumption has increased in the period from 1908 to 1916 over 265 per cent, and the price per cord during the same period has increased 229 per cent The increase in consumption if it continues at the same rate will necessitate the most expert handling of the forests in order to insure a supply for the future and the increase in price will be more rapid than it has been owing to the increasing scarcity and inaccessibility of the supplies.

The appointment of men to the outside service of the Dominion Forest Branch continues to be nothing short of a scandal. The District Foresters are compelled to consult the local political boss before making appointments and men are forced on them who are absolutely incompetent and often physically incapacitated. The Canadian Forestry Association made representations to Sir Wilfrid Laurier, when he was Premier, and has twice sent deputations to Sir Robert Borden. Both Premiers promised reforms, but nothing has been done. It is high time that a stop was put to this sort of thing for the good of the country at large. British Columbia has put its Forest Service on a merit basis and its example should be followed by the Dominion Government.

In France German prisoners under their own non-commissioned officers are working at lumbering and enjoying it hugely. They are said not to work very hard. The Canadian bushmen are put on the more technical jobs and superintendence. Much of the lumbering is done by attaching ropes and pulleys to the trunks of the trees and after cutting the roots pulling them over.

PLANTING PECANS

"It has been found that pecans thrive in Mississippi where I live," writes L. B. Fowler, of Shubuta, Miss., "and I am repeatedly asked: Does it pay to use dynamite to plant these trees? I put out 298 pecan trees in February, 1915, using 75 pounds of dynamite which, with caps and fuse, cost me $15.00. I did not lose a single tree. I have a neighbor that put out 46 trees in the same locality, in the same kind of soil, at the same time. He refused to blast his holes because of the expense He lost 40 trees out of the 46 and is now replanting, blasting all the holes this time. It cost me thirty cents a tree to set my trees, and it cost him twenty cents each to put his in the ground the first time. As all kinds of explosives have advanced in price the past year, it is costing him about thirty-five cents per tree to replant, thus making his total cost of planting fifty-five cents per tree. In addition, he must count as expense what the trees that died cost him. My trees are all thoroughly rooted by this time, so he is just one year behind me and always will be."

IMPLEMENT BLUE BOOK

The Midland Publishing Co., St. Louis, Mo., has left over a few copies of the 1916 Implement Blue Book, one of which it offers to mail free of charge to any subscriber of this magazine who will send 25 cents to pay the packing, postage, etc. The book has nearly 500 royal octavo pages and contains complete classified descriptive lists of all farming implements, tractors, tractor plows, vehicles, wagons, and kindred goods made in the United States, with names and addresses of manufacturers.

EXTENSION OF LACEY'S ORGANIZATION

WITH the opening of a New York office the firm of James D. Lacey & Company has increased its staff of experts by the addition of E. A. Sterling and C. A. Lyford. Mr. Sterling is in active charge of the New York office, which is located in the Forty-Second Street building at 30 East Forty-Second Street. He will serve as Eastern manager for the firm. Mr. Lyford has become chief forest engineer and will be located in the Seattle offices, where he will co-operate in field work and in the selling of timber properties.

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In thus strengthening its organization the firm increases its widely known facilities for technical service in properly estimating, mapping and reporting on timber properties. The expansion is in accordance with the firm's long recognition of the necessity for complete and accurate reports as a basis for the financial and operating phases of timber investments. Mr. Lacey has been actively indentified with the lumber business for several decades. Of the other members of the firm, Wood Beal has been associated with Mr. Lacey since 1882, and Victor Thrane since 1900. The firm is known to the entire lumber industry throughout North America.

As Eastern manager, Mr. Sterling brings to the firm broad experience, highly developed technical training and splendid ability. He is a graduate of Cornell with the degree of Forest Engineer. His college work was followed by a season of study in Europe, in 1903. After serving as forester with the New York State Forest Commission, he entered what was then the United States Bureau of Forestry. In this bureau and in the succeeding United States Forest Service he had wide opportunity for investigations and experience, covering the entire United States in his extensive travel. After two years of investigation into forest conditions in California he prepared and procured the passage of the first comprehensive forest law enacted in that state. As chief of the division of forest extension in the Forest Service, Mr. Sterling spent two years in administrative work and field travels in connection with the development of the government policy of reforestation in the National Forests and in giving assistance to private owners along the line of forest extension. For five years, from 1907, Mr. Sterling was chief forester of the Pennsylvania Railroad, in which field his work gained broad recognition. His next step was to establish himself as consulting forest and timber engineer. As a specialist in wood preservation he gained a national reputation and in 1913 he was elected president of the American Wood Preservers' Association. Recently Mr. Sterling has been manager of the trade extension department of the National Lumber Manufacturers' Association, where his constructive work was of great value.

To the duties of chief forest engineer Mr. Lyford will bring an experience of several years and an intimate knowledge of forest engineering work. His familiarity with tide-water timber in British Columbia is pre-eminent, besides which he has had broad experience in the pulp region of Eastern Canada. Some idea of the magnitude of his work may be had from the statement that his firm of Clark & Lyford, Limited, has made forest surveys of more than 5,000 square miles of territory, or 3,200,000 acres. Mr. Lyford was in personal charge of much of this work, often spending weeks and months in the commercial forests in order that the survey might be perfected on a high engineering basis. In connection with this work he effected an improvement in survey methods and placed timber estimating for pulp wood properties on a new scientific basis.

Mr. Lyford has been in charge of a British Columbia logging operation for some time. He is a graduate of Cornell University, with the degree of forest engineer. At college he was prominent in athletics, stroking the Cornell "four" and playing football and baseball. With the addition of Mr. Sterling and Mr. Lyford to its staff the firm of James D. Lacey & Company is in position to do even greater work than in the past. Mr. Lacey's home is at Newburgh, New York, and he will make the New York office his eastern headquarters.

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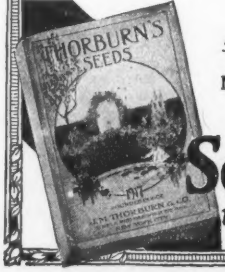

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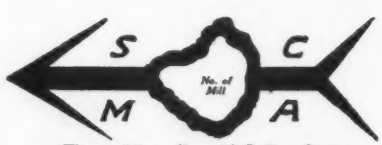

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